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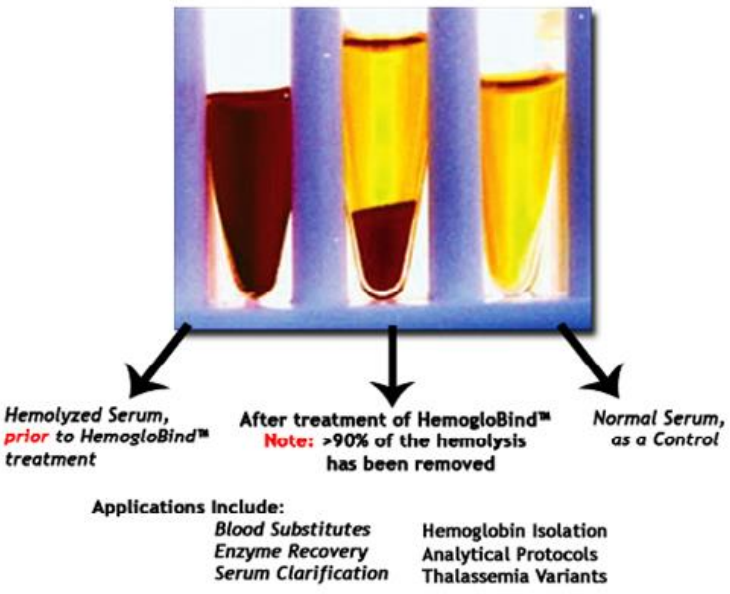
HemogloBind™ Kit

Hemoglobin Removal and Capture

- Has a high degree of specificity for hemoglobin, without cross-reacting with other proteins or analytes
- Suitable for
  - Hemolyzed serum/plasma
  - Whole Blood, Dried Blood Cards (DBS) or Erythrocyte lysates
  - Tissue Homogenates, compatible with RIPA buffer
- Applications in analytical interferences, enzyme monitoring, proteomics
- Species Agnostic
- Over 30 citations including analysis in cellular thermal shift assay (CETSA), LC-MS proteomics, Hemoglobin derivatives, Western blot, enzyme activity, ELISA
- Related product NuGel™HemogloBind™ comes in a dry powder format, compatible with high throughput 96-well automation, see https://www.biotechsupportgroup.com/NuGel-HemogloBind-Hemoglobin-Capture-Reagent-p/np-ho.htm

Poly-electrolytes are polymers with repeating units of stationary charges. HemogloBind™ is derived from insoluble elastomeric poly-electrolytes that bind proteins through an empirically derived chemistry combining elements of polymer composition, and cross-linking architecture. As with bio-polymers like DNA and Heparin, governing their reactivity is the spatial presentation of electrostatic groups along a flexible polymer chain.

HemogloBind™ does not cross react with most common serum components, making it an excellent tool in numerous applications. These include analytical protocols where optical interference is problematic. Hemoglobin variants, as in thalassemia, bind with differential affinity towards HemogloBind™, though this has not been fully evaluated. For purification and/or analysis of hemoglobin, a modest elevation in pH will facilitate desorption from the polymer.



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Catalog H0155-20S Items Included	For 20, 100 µl Preps	Reagent
HemogloBind™ suspension	2 ml	Supplied
Spin-filter / tube assemblies	20	Supplied

Additional Spin-Filters (low protein binding, 0.45 µm filter element) can be purchased separately, please inquire.

Specification

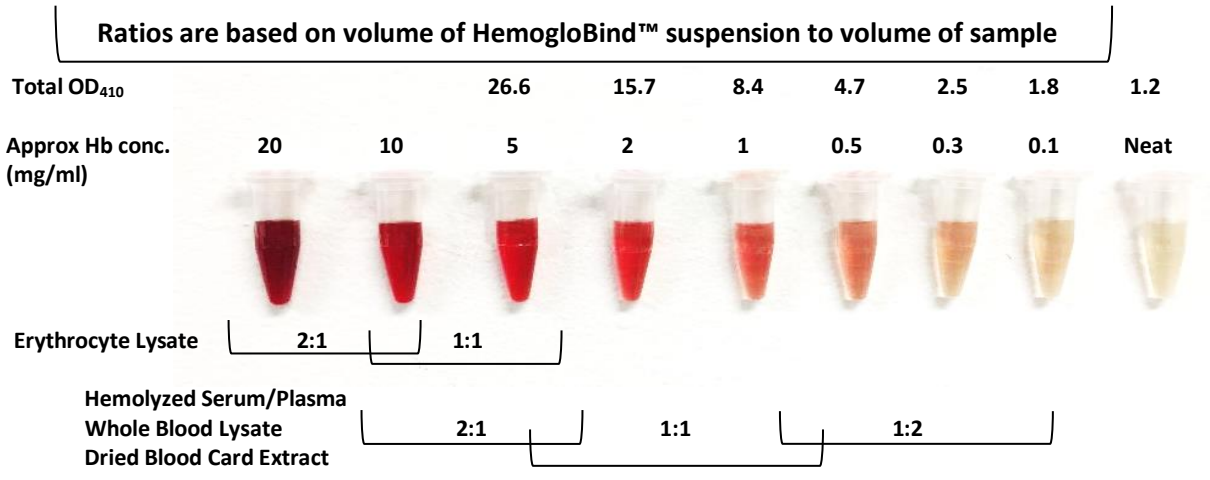
HemogloBind™ is supplied as an aqueous suspension of a synthetic polymer, pH 6.5. After centrifugation, the ratio of liquid to gel pellet is about 2 parts liquid, to 1 part pellet.

Storage

Supplied as an aqueous suspension of synthetic polymer, pH 6.5. The reagent when not used must be kept sealed and stored at 4°C. Do not freeze. HemogloBind™ retains full activity when stored at 4°C for 6 months. Expiration date is shown on label.

Notes: Hemoglobin concentrations in hemolyzed serum/plasma vary greatly. Protocols are intended as guidelines, but it is recommended to try different ratios of HemogloBind™ to sample for optimal results.

Guidelines for determining volume ratio of HemogloBind™ to sample. Use this chart to estimate the amount of Hemoglobin in samples containing mostly Hemoglobin (as in lysed erythrocytes) or mostly serum/plasma proteins (as in hemolyzed serum). Adjust volume ratio as necessary to optimize for investigative goals.



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PROTOCOL – To Treat 100 µl (1-2 mg Hb/ml) of Hemolyzed serum in Spin-Filter Tube

Note: volume ratio of HemogloBind™ can be adjusted up or down depending upon the amount of hemolysis

1. Shake the HemogloBind™ suspension.
2. Using wide-bore pipette tips, pipette 100 µl of the HemogloBind™ suspension into the filter of the Spin-Filter tube set.
3. Add 100 µl of the hemolyzed serum to the HemogloBind™ suspension. Vortex for 20 seconds.
4. Mix for 10 minutes.
5. Centrifuge for 1-2 minutes at 9000 RPMs (8,000xg).

Filtrate contains hemoglobin depleted sample suitable for further analysis, while the retained material contains the hemoglobin removed.

Desorption of Bound Hemoglobin

For purification and/or analysis of hemoglobin, 100 mM Tris-Borate, pH 9, will facilitate desorption of hemoglobin bound to HemogloBind™.

Hemoglobin Variants

Hemoglobin variants, as in thalassemia and glycosylated-hemoglobin, bind with differential affinity towards HemogloBind™. This has not been fully characterized.

Selection of HemogloBind ™ Reference Applications

Hemolyzed Serum Analyses

Neil Adrian P. Ondevilla, Peng-Wen Liu, Wan-Ting Huang, Tzu-Ping Weng, Nan-Yao Lee, Syu-Cing Ma, Jian-Jang Huang, Tak-Wah Wong, Hsien-Chang Chang, A point-of-care electrochemical biosensor for the rapid and sensitive detection of biomarkers in murine models with LPS-induced sepsis, Biosensors and Bioelectronics, Volume 254, 2024, 116202, ISSN 0956-5663, https://doi.org/10.1016/j.bios.2024.116202.

The article states "… Hemolysis is common in blood samples, which can interfere with the detection. Prior to the analysis, **the hemolyzed samples were pretreated for 15 min with Hemoglobind™**…"

Krishna, Neel K., and Kenji Cunnion. "Derivative Peptide Compounds and Methods of Use." U.S. Patent Application No. 15/192,934. http://www.freepatentsonline.com/y2016/0376322.html

The patent application describes synthetic peptide compounds for therapy and diagnostics of complement-mediated diseases, such as inflammatory diseases, autoimmune diseases, and microbial and bacterial infections and non-complement-mediated diseases, such cystic fibrosis and various acute diseases. The invention describes Peptide Inhibitors of Complement C1. In the example description, the patent states "Due to large amounts of hemolysis in the latter time points and the associated optical interference in bilirubin analysis, all the samples were pre-treated with HemogloBind™ (Biotech Support Group, NJ) prior to analysis with the Bilirubin Assay Kit."

Hemolyzed Serum Exosome Analyses

Nishida-Aoki, Nao, et al. "Disruption of Circulating Extracellular Vesicles as a Novel Therapeutic Strategy against Cancer Metastasis." *Molecular Therapy* 25.1 (2017): 181-191.

http://dx.doi.org/10.1016/j.ymthe.2016.10.009

The researchers report on a novel strategy of therapeutic antibody treatment to target cancer-derived EVs and inhibit the metastasis of breast cancer in a mouse model. The article states "Hemoglobin was accumulated with HemogloBind™ beads…EVs in the sera were concentrated by ultracentrifugation…".

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Red Cell Lysates

Barakat, Amey, et al. "Effects of 2, 3-DPG knockout on SCD phenotype in Townes SCD model mice." *American Journal of Hematology* (2023).

For Western blot analysis, the article states **"Red blood cells were lysed by vortexing and hemoglobin was depleted using HemogloBind™."**

Chen, Yaozhen, et al. "Noncanonical NLRP3 Inflammasome Activation Elicits the Programmed Death of Red Blood Cells ." *Available at SSRN 4626203*.

To investigate the downstream signaling of caspase-8 in mature RBCs, label free proteomic analysis was conducted. The article states "RBC lysates (control and complement-treated groups) **... Hemoglobin was removed by adding 250 µl of HemogloBind suspension (Biotech Support Group) to the cell lysate**. …Subsequently, samples without hemoglobin were analyzed using chromatography-tandem mass spectrometry (LC-MS/MS)". This analysis identified proteins with both upregulated and downregulated expressions in response to complement activation and revealed a significant involvement of biological processes and pathways associated with cytoskeleton organization and actin filament assembly dynamics.

Sae-Lee, Wisath, et al. " The protein organization of a red blood cell ." *Cell Reports* 40.3 (2022): 111103.

"For hemolysate preparations, remnant white ghosts were removed by centrifugation at 21,000 ×g for 40 min at 4°C, and **the supernatant treated with HemogloBind (Biotech Support Group) in order to bind and remove free Hgb**."

Zhan, Jing, et al. "Silica nanoparticles trigger phosphatidylserine exposure in red blood cells and induce thrombosis risk." *Environmental Pollution* (2023): 121591.

For Western blot analysis, the article states "To evaluate the phosphorylated ERK1/2 and total ERK1/2, the protein samples from different groups **were mixed with 100 µL of HemogloBind™ suspension (Biotech Support Group LLC, NJ, USA) that could specifically adsorb hemoglobin**".

Hojo-Souza NS, de Azevedo PO, de Castro JT, Teixeira-Carvalho A, Lieberman J, et al. (2020) Contributions of IFN-γ and granulysin to the clearance of Plasmodium yoelii blood stage. PLOS Pathogens 16(9): e1008840. https://doi.org/10.1371/journal.ppat.1008840

The authors investigated how Plasmodium infection induces MHC-I expression on Retics. In addition, whether granulysin helps control Plasmodium infection *in vivo* has not been studied. To remove interferences associated with Hemoglobin, the article states, "For western blot analysis, erythroblasts pellets were resuspended in RIPA Buffer (Sigma)…. The Retics were treated with HemogloBind …".

Dziekan, Jerzy Michal, et al. "Cellular thermal shift assay for the identification of drug–target interactions in the Plasmodium falciparum proteome." Nature Protocols (2020): 1-41.

The cellular thermal shift assay (CETSA) protocol presents a comprehensive strategy for the identification of drug targets. CETSA enables proteome-wide target screening for unmodified compounds with undetermined mechanisms of action, providing quantitative evidence about direct drug–protein interactions. The workflow involves treatment of *P. falciparum*–infected erythrocytes with a compound of interest, heat exposure to denature proteins, soluble protein isolation, enzymatic digestion, peptide labeling with tandem mass tags, offline fractionation, and LC-MS analysis. The article states "**The intact-cell CETSA protocol features a HemogloBind- based sample processing step, which provides a relatively fast, reliable and inexpensive method to deplete >90% of hemoglobin from processed intact-cell samples. As a result, it leads to a 40-50% increase in the number of peptide spectrum matches (PSMs) for *P. falciparum* and non-hemoglobin human proteins.".**

Nguyen, Anthony T., et al. "UBE2O remodels the proteome during terminal erythroid differentiation." *Science* 357.6350 (2017): eaan0218.

This study used multiplexed quantitative proteomics to identify candidate substrates of UBE2O, an E2 (ubiquitin-conjugating) enzyme, in an unbiased and global manner. **Because of the overly abundant presence of Hemoglobin, selective depletion of Hemoglobin was necessary.** The article states "Reticulocytes were lysed by vortexing for 5 minutes at room temperature… An additional 10 bed vol of Hemoglobind™ suspension was added to the samples, which were then vortexed for another 10 min at room temperature followed by 4 min of centrifugation at 10000 x *g*. The supernatants, which contain hemoglobin-depleted sample, were … processed for TMT quantification.".

Whole Blood Lysates

de Boni, Laura, et al. "Aggregation-resistant alpha-synuclein tetramers are reduced in the blood of Parkinson's patients." *EMBO Molecular Medicine* (2024): 1-18.

Synucleinopathies such as Parkinson's disease (PD) are defined by the accumulation and aggregation of the α-synuclein protein in neurons, glia and other tissues. In this study, an in vitro-cross-linking protocol for human EDTA-whole blood was used to determine the relative levels of disordered and higher-ordered multimeric forms of cytosolic α-synuclein in blood. The protocol incorporated **HemogloBind™ to remove interference from Hemoglobin**.

Das, Amaresh, et al. "Enhanced Recovery and Detection of Highly Infectious Animal Disease Viruses by Virus Capture Using Nanotrap® Microbiome a Particles." (2024).

This study reports the use of Nanotrap® Microbiome A Particles (NMAPs) to capture and concentrate viruses from diluted suspensions to improve their recovery and sensitivity of detection by real-time PCR/RT-PCR (qPCR/RT-qPCR). Five highly infectious animal disease viruses were used in this study. NMAPs were used to capture spiked viruses from EDTA whole blood (EWB). Virus capture from EWB was partially blocked, most likely by hemoglobin (HMB), which also binds NMAPs and outcompetes the viruses. **The interference effect from hemoglobin could be removed by first using HemogloBind™** (Biotech Support Group; Monmouth Junction, NJ), without interfering with virus capture.

Kaneko, Tomonori, et al. " System-wide hematopoietic and immune signaling aberrations in COVID-19 revealed by deep proteome and phosphoproteome analysis. " Research Square preprint (2021).

The author's goals were to gain systems-level insights into SARS-CoV-2 pathogenesis. For that, they compared the blood proteome and phosphoproteome of ICU patients with or without SARS-CoV-2 infection, and healthy control subjects by quantitative mass spectrometry. To remove the highly abundant amount of Hemoglobin, the article states "**Hemoglobin was depleted from PBMC whole cell lysate samples according to HemogloBind ™** manufacturer instruction with modifications."

Leitner, Dominique F., et al. "Metabolomic, Proteomic, and Transcriptomic Changes in Adults with Epilepsy on Modified Atkins Diet." *Epilepsia* (2023).

For Plasma Metabolomics, the article states "Whole blood was thawed on ice and processed to remove hemoglobin by NuGel-HemogloBind according to manufacturer protocol…"

Kaneko, Tomonori, et al. "Kinome and phosphoproteome reprogramming underlies the aberrant immune responses in critically ill COVID-19 patients." (2023).

The article states "For Sample processing for proteomics by mass spectrometry**,… Hemoglobin was depleted from PBMC whole cell lysate samples according to HemogloBind** (Biotech Support Group LLC) manufacturer instruction …" The report shows that COVID-19 PBMC proteome and phosphoproteome undergo dynamic changes during disease progression, and the corresponding protein or phosphoprotein signatures can distinguish longitudinal disease states.

Lahut, Suna, et al. "Blood RNA biomarkers in prodromal PARK4 and REM sleep behavior disorder show role of complexin-1 loss for risk of Parkinson's disease." *Disease Models & Mechanisms* (2017): dmm-028035. http://dmm.biologists.org/lookup/doi/10.1242/dmm.028035

The authors studied blood samples from a new large pedigree with *SNCA* gene duplication (PARK4 mutation), to identify effects of SNCA gain-of-function as potential disease biomarkers. The article states "For protein extraction from the EDTA tubes, 300 µl blood were lysed with equal amount of 1% SDS-RIPA buffer [50 mM Tris-HCl (pH 8.0), 150 mM NaCl, 1 mM EDTA, 1 mM EGTA, 1% Igepal CA-630 (Sigma), 0.5% sodium deoxycholate, 0.1% SDS, 1 mM PMSF and one tablet Complete Protease Inhibitor Cocktail (Roche)] and sonicated for 10 sec. The blood lysates were rotated at 4 °C for 30 min and centrifuged at 4 °C for 30 min. **The supernatants were depleted in hemoglobin content using a commercial kit (HemogloBind™)** following the manufacturer's instructions".

Chalásová, Katarína, et al. "Transketolase Activity but not Thiamine Membrane Transport Change in Response to Hyperglycaemia and Kidney Dysfunction." *Experimental and Clinical Endocrinology & Diabetes* (2017). https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0043-115009

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Diabetic kidney disease, a common complication of both type 1 and type 2 diabetes, is associated with significant morbidity and mortality, and represents the most common cause of chronic kidney disease. The study hypothesized that protective pentose phosphate pathway action in diabetes might be compromised by limited intracellular availability of an active transketolase cofactor thiamine diphosphate (TDP). To evaluate the levels of thiamine transporter proteins in whole blood, t he article states " For protein isolation, **whole blood aliquots were lysed with water and haemoglobin was removed using HemogloBind™** (Biotech Support Group) according to manufacturer's instructions…".

Hemoglobin Isolation and Derivative Analysis
Dasauni, Pushpanjali, et al. "Optimization and Identification of Single Mutation in Hemoglobin Variants with 2, 2, 2 Trifluoroethanol Modified Digestion Method and Nano– LC Coupled MALDI MS/MS." *Molecules* 27.19 (2022): 6357.
"The use of Hemoglobind reduced the time to obtain pure Hb in an easy single–step procedure. Pure Hb protein is required specifically to optimize and standardize methods for diagnostics. … The desorbed Hb was compatible with LC–MS, and other proteomics studies, as we verified, did not show any change in its intact mass either. This one–step affinity purification gave us the utmost purified Hb."

Igoh, Akihisa, Masanobu Miura, and Satoru Miyaishi. "Animal Species and Blood Identification with Peptide Mass Fingerprinting." Analytical Chemistry (2024). https://doi.org/10.1021/acs.analchem.3c04314
The article states "We have developed the application of commercially available reagents for simply purifying hemoglobin from a wide range of animal species. …Blood, saliva, urine, semen, and sweat (20 μL); filter paper from which sweat was collected; and 0.5, 1, 2, and 5 μL of **pooled blood samples were treated with HemogloBind™** (BIOTECH SUPPORT GROUP, NJ, USA) to obtain hemoglobin solutions following manufacturer's protocol. …Hemoglobin was then dissociated according to the protocol to obtain a purified solution…."

"Post-Mortem Changes of Methomyl in Blood with Hemoglobin" *Chem. Res. Toxicol.* 2021, 34, 1, 161–168 January 6, 2021; https://doi.org/10.1021/acs.chemrestox.0c00472
In this study, the researchers considered specific methomyl hemoglobin adducts detected by liquid chromatography quadrupole time-of-flight mass spectrometry (LC-Q/TOF-MS). **To help isolate Hemoglobin, the article states "Hb was separated with HemogloBind** in accordance with the manufacturer's instructions." The authors conclude that one Hemoglobin derivative, the W-adduct could be used as a biomarker of methomyl poisoning.

Tissue Lysates, LC-MS Proteomics
Jara, Zaira Palomino, et al. "Distinct Mechanisms of β-Arrestin–Biased Agonist and Blocker of AT1R in Preventing Aortic Aneurysm and Associated Mortality." *Hypertension* 80.2 (2023): 385-402.
The article states "Cleaned abdominal aortas were homogenized in T-PER Tissue Protein Extraction reagent…. **Abdominal aneurysm samples were treated to remove hemoglobin captured within the vessel wall. NuGel-HemogloBind … was used** according to the manufacturer protocol."

Heather E. McKiernan, Phillip B. Danielson, Catherine O. Brown, Masha Signaevsky, Christian G. Westring and Kevin M. Legg, Developmental Validation of a Multiplex Proteomic Assay for the Identification of Forensically Relevant Biological Fluids, Forensic Science International, (2021)
https://www.sciencedirect.com/science/article/pii/S0379073821002280?via%3Dihub

The aim of this study was to validate a multiplex proteomic assay for the identification of target peptide fragments by multiple reaction monitoring on a triple quadrupole mass spectrometer originating from tissue-specific proteins. The article states **"If samples contained excessive quantities of hemolyzed red blood cells, four volumes of HemogloBind™ were added**." The authors conclude that the mass spectrometry-based workflow offers significant advantages compared to existing serological methods.

C Wan, B Borgeson, S Phanse, F Tu, K Drew, G Clark, et al. Panorama of ancient metazoan macromolecular complexes. Nature Volume:525, Pages:339–344 Date published:(17 September 2015). doi:10.1038/nature14877.

HemogloBind™, contributed to this rigorous examination of protein complexes. When our products (**HemogloBind™ & NRicher™ 6**) were used as a pretreatment step in the overall workflow, twice the number of observations and annotations became possible. Furthermore, this study demonstrated the importance of a key feature implicit to all of our products; that is the maintenance of functional and structural integrity after separations.

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Species Agnostic – Applications to Different Species
Zhang, X., Li, S., Malik, I. *et al.* Reprogramming tumour-associated macrophages to outcompete cancer cells. *Nature* (2023). https://doi.org/10.1038/s41586-023-06256-5To measure the amino acid content by LC-MS from tumor interstitial fluid, the article states "**Samples were brought through a NuGel-HemogloBind (Biotech Support Group) prep prior to extraction to remedy the levels of haemolysis present.**

Igoh, Akihisa, Masanobu Miura, and Satoru Miyaishi. "Animal Species and Blood Identification with Peptide Mass Fingerprinting." Analytical Chemistry (2024). https://doi.org/10.1021/acs.analchem.3c04314
The article states "We have developed the application of commercially available reagents for simply purifying hemoglobin from a wide range of animal species. …Blood, saliva, urine, semen, and sweat (20 μL); filter paper from which sweat was collected; and 0.5, 1, 2, and 5 μL of **pooled blood samples were treated with HemogloBind™** (BIOTECH SUPPORT GROUP, NJ, USA) to obtain hemoglobin solutions following manufacturer's protocol. …Hemoglobin was then dissociated according to the protocol to obtain a purified solution…."

Witchey, Shannah K., et al. "Reproductive and developmental toxicity following exposure to organophosphate ester flame retardants and plasticizers, triphenyl phosphate and isopropylated phenyl phosphate, in Sprague Dawley rats." *Toxicological Sciences* (2022). https://doi.org/10.1093/toxsci/kfac135
The investigators used HemogloBind™ to reduce interferences associated with Hemoglobin in whole blood lysates; the article stating "Blood samples…were analyzed for Acetylcholinesterase and Butyryl cholinesterase activity…"

D'Alessandro, Angelo, et al. "Hematologic and systemic metabolic alterations due to Mediterranean type II G6PD deficiency in a novel murine model." *bioRxiv* (2021).

To generate a more accurate model of Glucose 6 phosphate dehydrogenase deficiency, the human sequence for a severe form of G6PD deficiency (Med -) was knocked into the murine G6PD locus and confirmed by Western blot. The article states "Briefly, RBCs were washed 3 times PBS, followed by transfer of one part washed RBCs into three parts water, followed by end over end rotation for 5 min at room temperature to lyse the RBCs. **Lysed RBCs were then mixed 1:1 with HemogloBind™**, followed by end over end rotation for 10 min at room temperature. HemogloBind™ and bound hemoglobin were pelleted by centrifugation, and supernatants subjected to an additional hemoglobin depletion with HemogloBind™. Supernatants were used for western blotting."

Southwell, Rebecca Marie, Kenneth Sherlock, and Matthew Baylis. "Cross-sectional study of British wild deer for evidence of Schmallenberg virus infection." Veterinary Record (2020).

The purpose of this study was to survey wild deer across Great Britain for recent evidence of Schmallenberg virus (SBV). Postmortem blood samples were tested for SBV antibodies. Because of the presence of Hemoglobin interference in many samples, the article states "**In order to avoid poor quality samples yielding false ELISA results, 59 samples estimated to have above 50mg/dL and less than 250mg/dL haemoglobin concentration, according to their colour, were selected for treatment with HemogloBind™** (Biotech Support Group, New Jersey, USA).".

Snider, Thomas H., Christina M. Wilhelm, Michael C. Babin, Gennady E. Platoff Jr, and David T. Yeung. "Assessing the therapeutic efficacy of oxime therapies against percutaneous organophosphorus pesticide and nerve agent challenges in the Hartley guinea pig."The Journal of Toxicological Sciences 40, no. 6 (2015): 759-775.

Clinical signs of cholinesterase inhibitor toxicity can be measured from blood cholinesterase [Acetylcholinesterase (AChE) and butyrylcholinesterase (BChE)] activity utilizing a modified Ellman's method. Biotech Support Group's unique solid-phase polymer for hemoglobin depletion, was used for pretreatment. The article states "Briefly, whole blood samples were treated with HemogloBind™ which interferes with the ChE activity assay due to spectral overlap."

Craig, J. R., et al. "A comparison of the anatomical and gastrointestinal functional development between gilt and sow progeny around birth and weaning." *Journal of animal science* (2019).

Gilt progeny (GP) often have restricted growth performance and health status in comparison to sow progeny (SP) from birth. To better understand underlying mechanisms, the study aimed to compare differences in growth and development between GP and SP in the first 24 h after birth and in the peri-weaning period. Because serum

samples were quite hemolysed after collection and processing, it became necessary to use HemogloBind™ to allow for better detection of IgG by ELISA. The article states "As per the manufacturer's instructions, 250 µL of Hemoglobind was added to 250 µL of hemolyzed serum…

Parvathi S. Kumar, Haree K. Pallera, Pamela S. Hair, Magdielis Gregory Rivera, Tushar A. Shah, Alice L. Werner,Frank A. Lattanzio, Kenji M. Cunnion, and Neel K. Krishna. Peptide inhibitor of complement C1 modulates acute intravascular hemolysis of mismatched red blood cells in rats.TRANSFUSION Volume 00, May 2016. doi:10.1111/trf.13674.

In brief, the study evaluated the role of a peptide inhibitor of complement C1 (PIC1) in an animal model of acute intravascular hemolysis in both prevention and rescue scenarios. The authors state "To remove free Hb that may cause optical interference in bilirubin analysis, we treated all the samples with Hb depletion from hemolyzed serum/plasma (HemogloBind). Bilirubin concentration was then measured with a Bilirubin Assay Kit (Sigma-Aldrich, St. Louis, MO)."

Urine

Dugbartey, George J., et al. "Static cold storage with mitochondria-targeted hydrogen sulfide donor improves renal graft function in an ex vivo porcine model of controlled donation-after-cardiac-death kidney transplantation." *International Journal of Molecular Sciences* 24.18 (2023): 14017.

Urine and arterial blood samples were collected hourly during reperfusion. The article states "Urine protein levels were measured using an IDEXX Urine Analyzer (IDEXX Laboratories, Westbook, ME, USA) **following a 1:3 dilution of urine in HemogloBind (Biotech Support Group, Monmouth Junction, NJ, USA) to obtain clearer urine samples** after 10 min of vigorous shaking and centrifugation at 12,000× g.".

Blood Substitutes

Juriasingani, Smriti, et al. "Evaluating the Effects of Subnormothermic Perfusion with AP39 in a Novel Blood-Free Model of Ex Vivo Kidney Preservation and Reperfusion." *International Journal of Molecular Sciences* 22.13 (2021): 7180.

This study evaluated whether adding hydrogen sulfide donor AP39 to Hemopure, a blood substitute, during subnormothermic perfusion improves kidney outcomes. Because of the added Hemopure, the article states, "Most of the urine samples collected were heavily pigmented, due to the presence of hemoglobin from the Hemopure, which prevented the use of conventional urinalysis methods. A 1:3 dilution of urine in Hemoglobind (Biotech Support Group, Monmouth Junction, NJ, USA) allowed us to obtain clearer urine samples after 10 min of vigorous shaking and centrifugation at 12,000× *g*."

Laing, Richard W., et al. "The use of an acellular oxygen carrier in a human liver model of normothermic machine perfusion." *Transplantation* 101.11 (2017): 2746.

For a full list of Hemoglobin Removal References, visit:
https://www.biotechsupportgroup.com/References-s/138.htm#hemoglobin-depletion

RELATED SAMPLE PREP PRODUCTS:

Albumin & IgG Removal products:
https://www.biotechsupportgroup.com/Albumin-Removal-s/307.htm

Lipid Removal Reagent and Clarification products:
https://www.biotechsupportgroup.com/Lipid-Removal-s/316.htm

CONTACT US

We welcome your questions, comments and concerns regarding our products.

Call 732-274-2866, Monday – Friday 9am-6pm EST.
Email sales@biotechsupportgroup.com
Mail 1 Deer Park Drive, Suite M, Monmouth JCT, NJ 08852, USA