

Plant-Made
Biopharmaceuticals



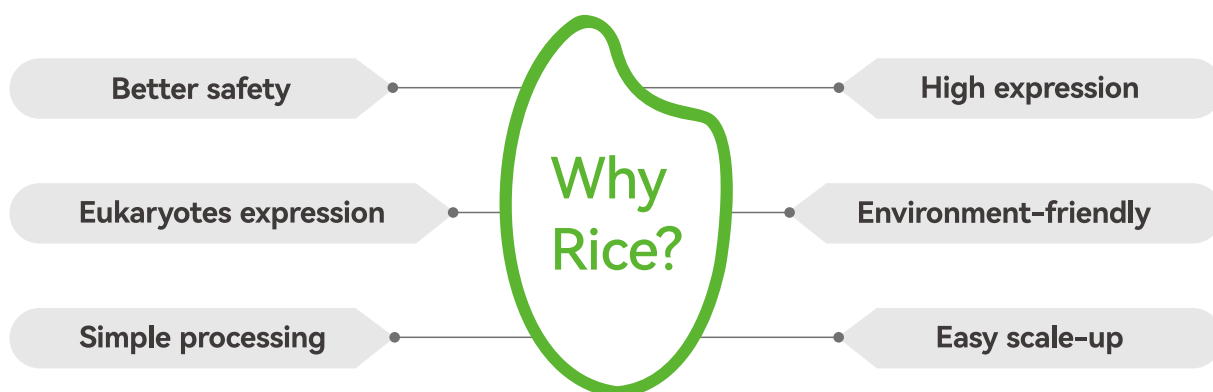
OsrHSA

Rice derived Recombinant
Human Serum Albumin

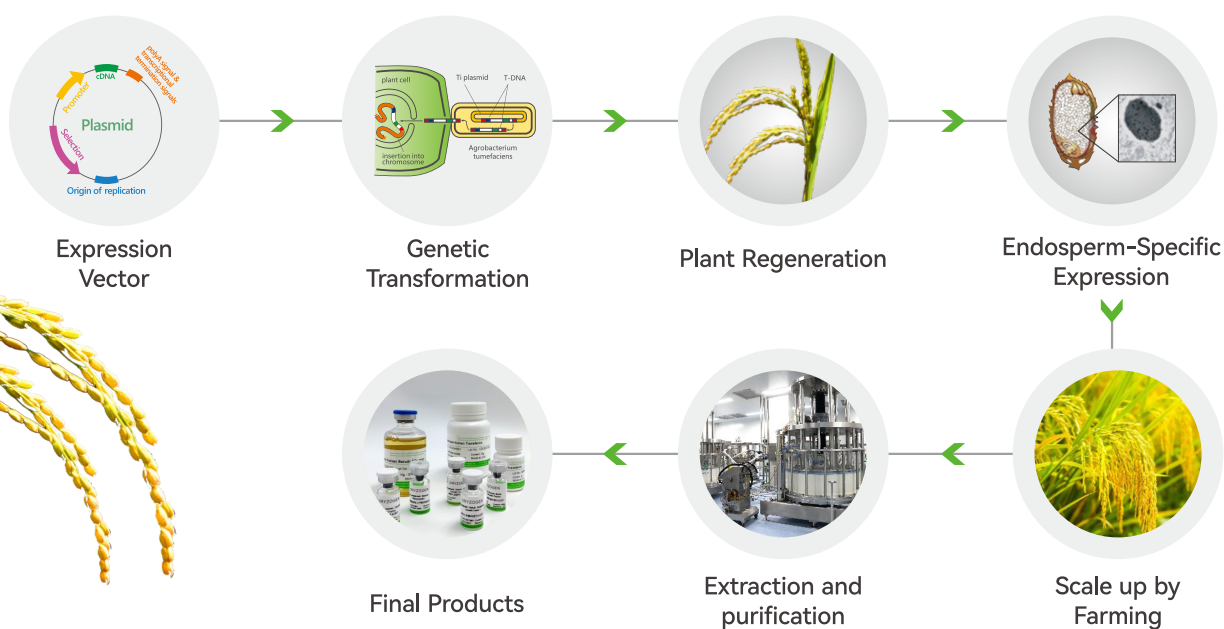
A safer
More stable
More reliable choice

Human serum albumin is the most abundant protein in human plasma, serving to transport hormones, lipids, and various molecules, while also buffering pH and maintaining osmotic pressure.

Utilizing the patented Oryz^{HiExp} platform—which leverages rice endosperm cells as bioreactors for specific, high-yield expression of recombinant proteins and small peptides—OsrHSA is produced and stored within the rice protein body, thereby preserving its stability and bioactivity to maximum extent. With the world's advanced facility and top production processes to extract and purify the OsrHSA, Healthgen Biotechnology can guarantee the excellent batch-to-batch consistency of OsrHSA.

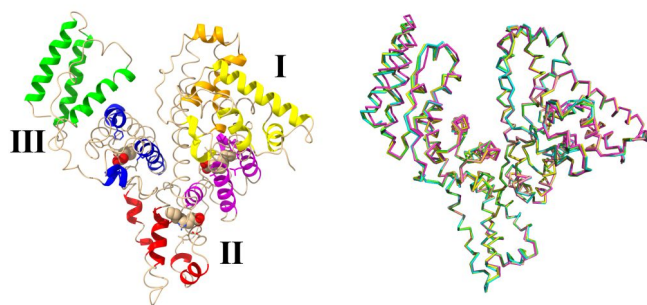


Production Process of OsrHSA

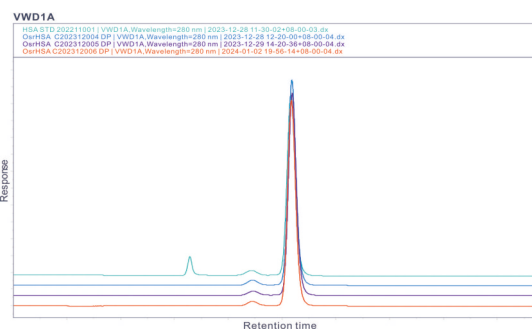


Comparison of physical and chemical properties of OsrHSA and pHSA

Char.	pHSA	OsrHSA
Amino Acids Sequence	Same	
N-terminus	DAHKSEV	DAHKSEV
C-terminus	KLVAASQAALGL	KLVAASQAALGL
Glycosylation	No	
Molecular Mass(MALDI)	66.554KD	66.550KD
PI	4.8	4.8
Drug Binding	Similar	
Thermal Stability	M/P 65°C	M/P 65°C
Crystal Structure	Identical	

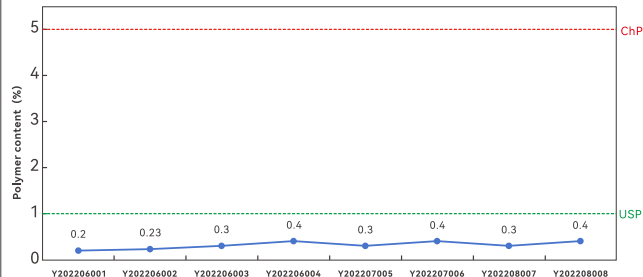


The overall structure of OsrHSA is a heart shape formed by three helical domains, designated I, II, and III, and no obvious differences in main-chain conformations were identified between pHSA and OsrHSA.

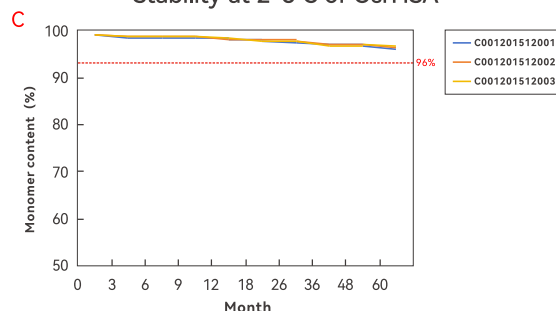


SEC-HPLC method was used to detect pHSA in pale blue and OsrHSA in other colors. The OsrHSA spectra of the three batches were highly overlapping, with purity greater than 99%, indicating high consistency between batches.

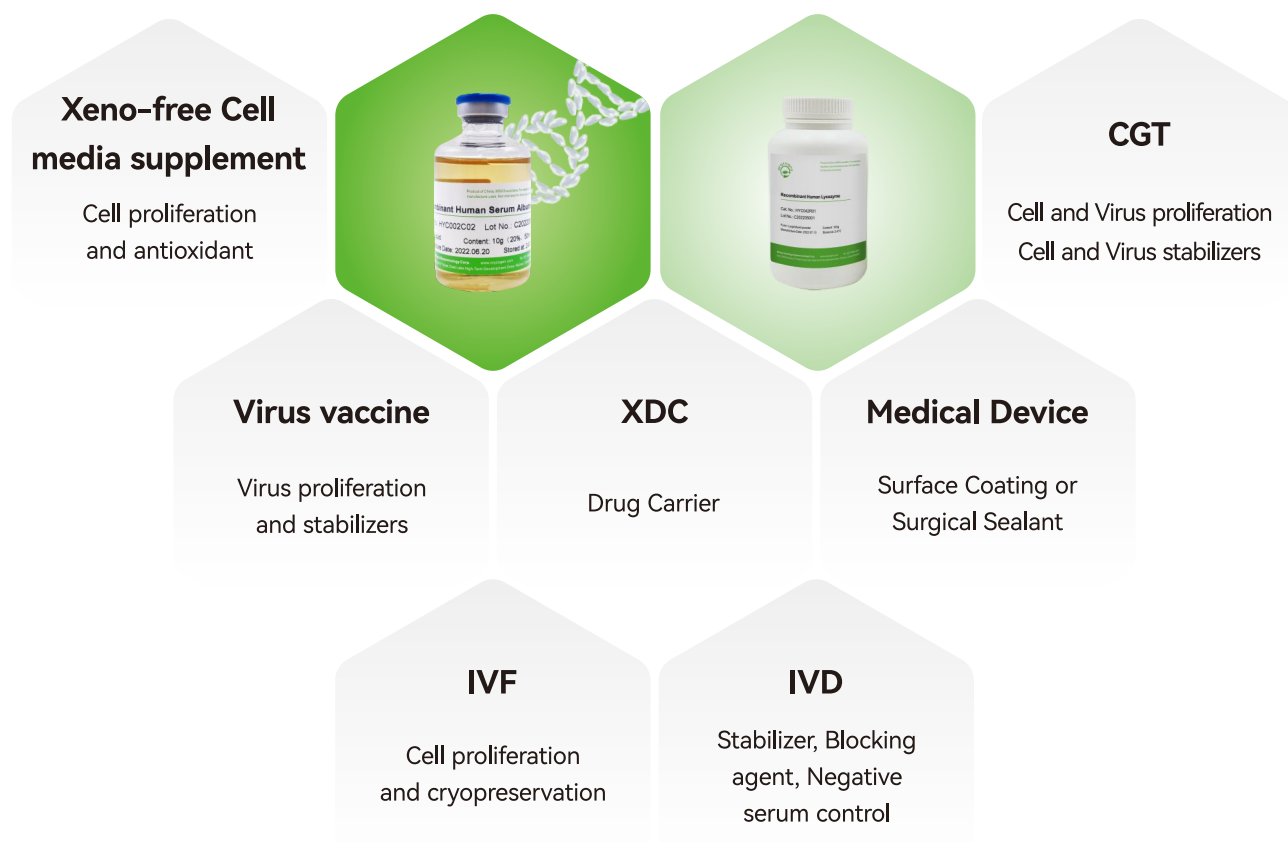
Polymer content of different batches of OsrHSA



Stability at 2-8°C of OsrHSA



OsrHSA applications



A variety of different grades of OsrHSA for different applications

Item	OsrHSA Premium		OsrHSA Advanced			OsrHSA Precise	
Cat. No.	HYC002C02	HYC002C01	HYC002M01 (Regular)	HYC002M02 (High purity)	HYC002M03 (High stability)	HYC002R01	HYC002R02
Form	Liquid	Lyophilized powder	Lyophilized powder	Lyophilized powder	Lyophilized powder	Lyophilized powder	Lyophilized powder
Purity	NLT 99.0%	NLT 99.0%	NLT 99.0%	NLT 99.0%	NLT 99.0%	NLT 90.0%	NLT 90.0%
Endotoxin	< 1.67EU/ml	< 0.01EU/mg	< 0.125EU/mg	< 0.125EU/mg	< 0.125EU/mg	/	< 5.0EU/mg
Package	50ml, 20%/10g	1g, 10g, 100g	1g, 10g, 50g, 100g, 1kg			1g, 10g, 50g, 100g, 1kg	

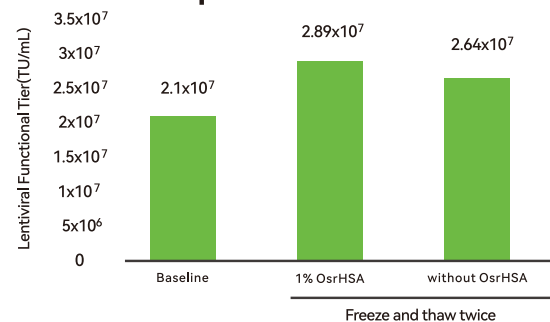
Application in CGT and Virus vaccine

Application	Upstream Process	Downstream process	Cryopreservation	Final Formulation
Cell Therapy	Cell separation,cell proliferation,Cell differentiation	Release cell stress and prevent absorption	Improve cell viability during storage and post thaw	Cell protectant in the cell infusion process to avoid cell aggregation
Gene Therapy	Optimize viral vector manufacture,Prevent viral particle aggregation	Prevent aggregation and absorption	Support storage and post thaw	Improve viral transduction; Prevent aggregation and surface absorption
Virus Vaccine	Virus proliferation	Improve virus viability during purification and concentration	Support storage and post thaw	Virus stabilizer to extend the half-life of peptide

Why OsrHSA?

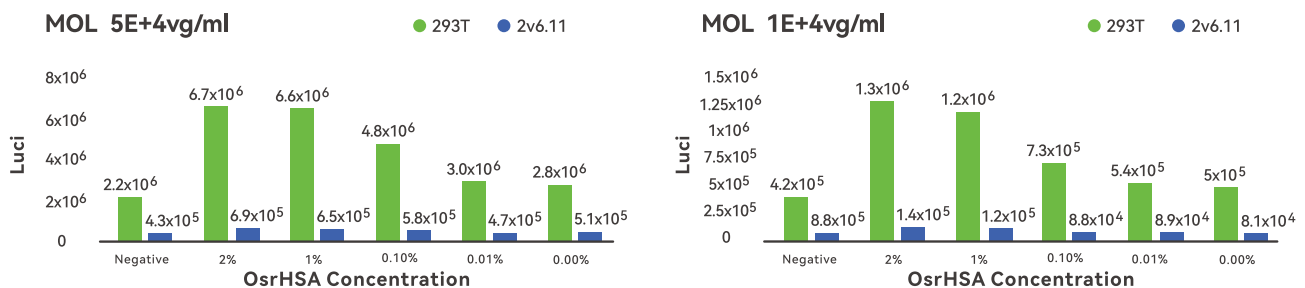
- ✓ Much safer, blood components free as an alternative to pHSA
- ✓ Chemically-Defined, Easy and stable for your quality control
- ✓ Superior batch-to-batch consistency
- ✓ Stable bulk supply by 10 tons annual capacity
- ✓ DMF(No.29648)approved by the US FDA
- ✓ cGMP compliance

OsrHSA in LTV freeze-thaw protectant



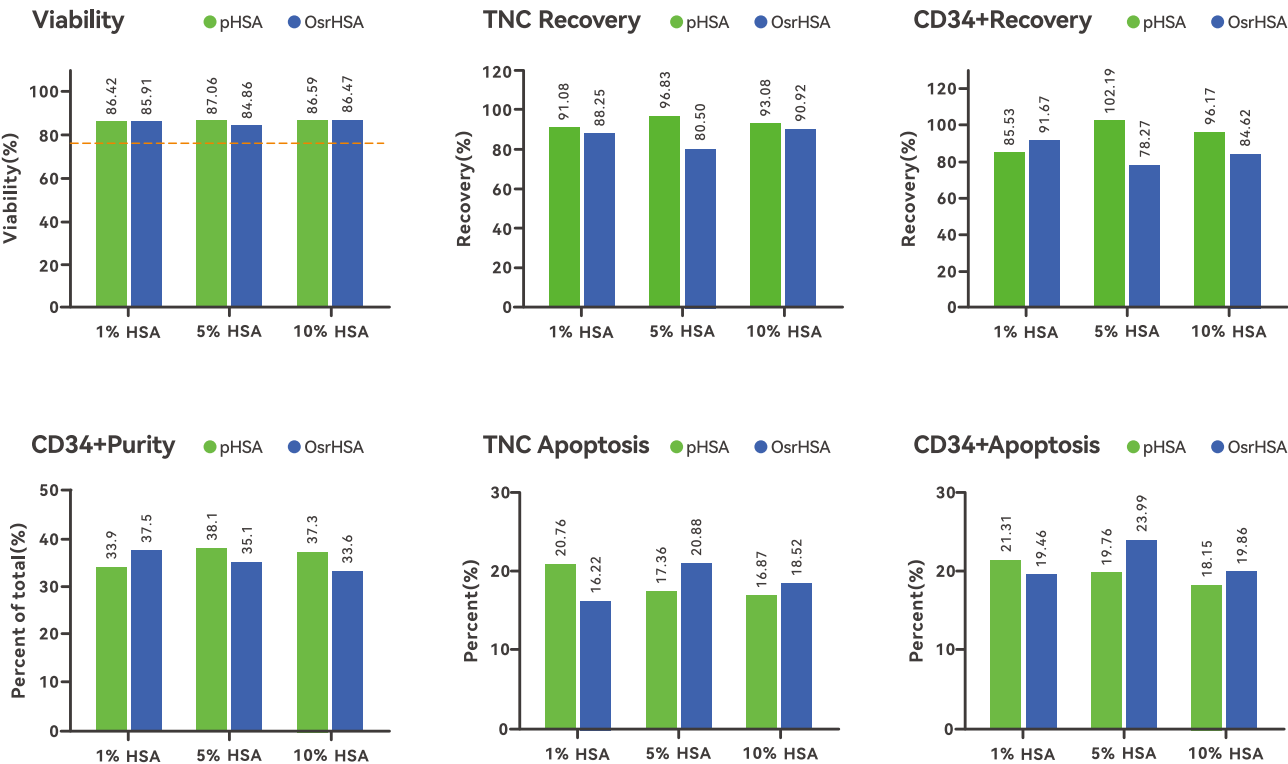
After two freeze-thaw cycles, the lentivirus containing OsrHSA showed a significantly higher titer than the virus without it.

OsrHSA in AAV infection efficiency



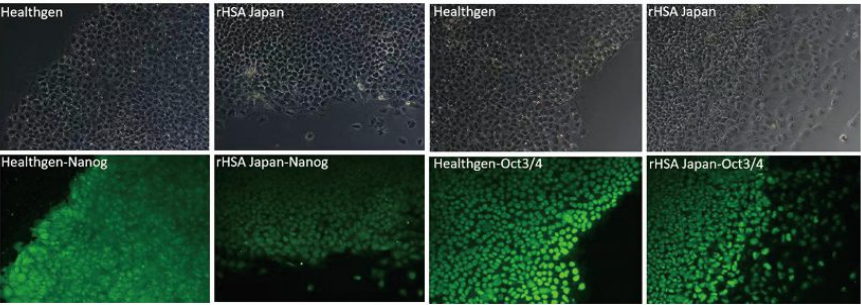
After incubation of OsrHSA and AAV9, its infection was enhanced efficiency, the trend was consistent under the condition of different MOI virulence, and the promotion effect was enhanced with the concentration of OsrHSA increased. The intensity of this promotion varied in different cell lines, such as 293T > 2v6.11.

OsrHSA in cell recovery



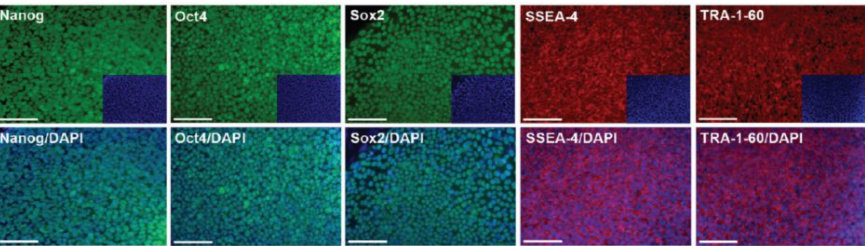
An evaluation of OsrHSA for mesenchymal stem cell (MSC) cryopreservation was conducted. The cryopreservation and post-thaw recovery efficacy of OsrHSA yielded results with no significant difference from those using natural human serum albumin. Notably, a 1% concentration of OsrHSA exhibited superior performance compared to natural human serum albumin regarding thawed CD34⁺ cell recovery rate, purity, apoptosis rate, and the apoptosis rate of total nucleated cells (TNC).

OsrHSA in iPSC undifferentiation



From the morphology of colonies, ALP staining and immunofluorescent staining, we found that OsrHSA was more effective in keeping undifferentiation and keeping viability of iPS cells.

OsrHSA in ESC undifferentiation



The ESC (HUES 71) maintained a robust undifferentiated state even after 65 passages in a xeno-free culture system supplemented with OsrHSA. (scale: 500 μ m)

Application in IVD

Bovine serum albumin (BSA) and human plasma-derived human serum albumin (pHSA) have been widely used as raw materials in the IVD industry. However, as serum-derived components, they inherently contain impurities such as IgG, proteases, hormones, and fatty acids, which can lead to false positive results, especially for some test items that require higher sensitivity and higher accuracy.



OsrHSA (Recombinant Human Serum Albumin) – a superior, rice-derived alternative designed to enhance the performance of diagnostic products.

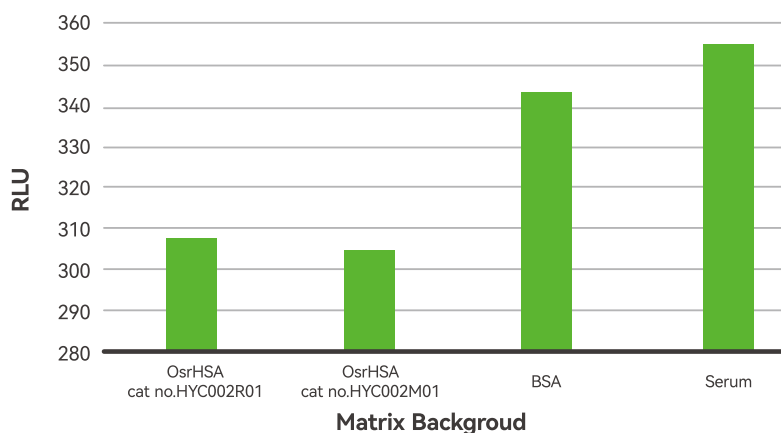
Items	OsrHSA	pHSA	BSA
No interference from blood components	✓	✗	✗
Batch consistent	✓	✗	✗
Supply reliability	✓	✗	✗
TSE/BSE certificate	✓	✓	✗



Application	Use	Test Items suggested
Chemiluminescence	Stabilizer/protectant	1.Vitamins: Folic Acid/Vitamin B9, Vitamin B12, Vitamin D 2.Hormones 3.Growth Factors 4.Autoantigen and antibody
Chromatography	Competing Antigen	Urinary Microalbumin
Mass Spectrometry	Matrix control component	Small molecules, such as hormones

●● RLU of Matrix background

(OsrHSA compared with BSA & Serum)



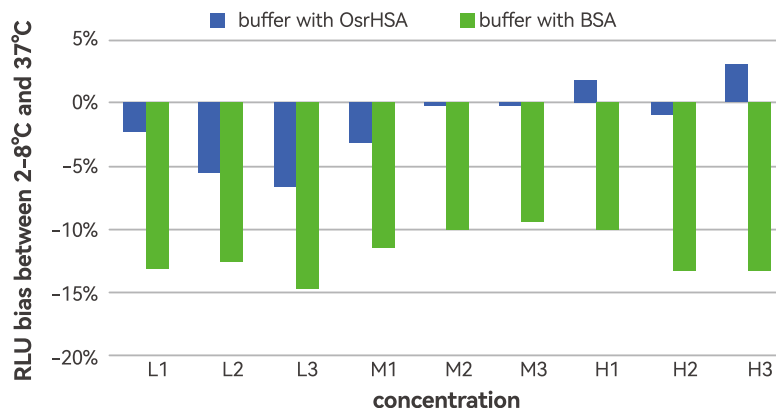
After replacing all the BSA in the calibrator or serum matrix with OsrHSA, there was a significant improvement in the background of the assay, and there was no jump in value.

From the chart, we found that OsrHSA (cat no.HYC002M01) is the best choice for matrix background, then OsrHSA (cat no.HYC002R01), which are much better than HSA and Serum.

●● RLU Bias in magnetic bead buffer

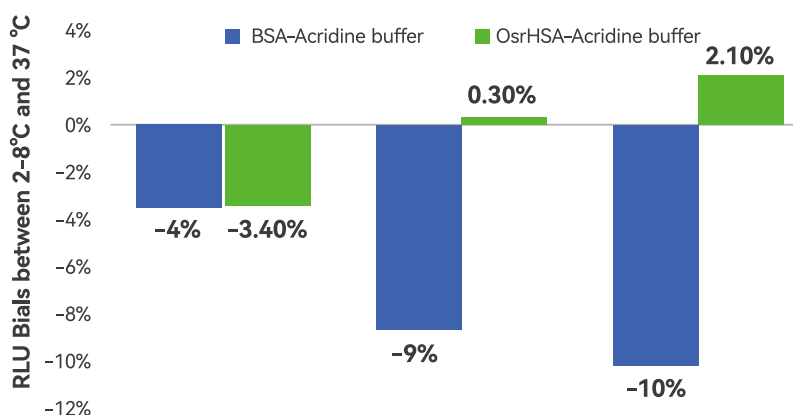
(OsrHSA compared with BSA)

The magnetic bead buffer was formulated with OsrHSA and BSA separately, then tested in different concentration from low to high, under 2-8°C and 37°C. The results show that the buffer with OsrHSA has lower bias than that with BSA, improving the reliability and reproducibility of experiments.



●● RLU Bials in albumin-acridine buffers

(OsrHSA compared with BSA)

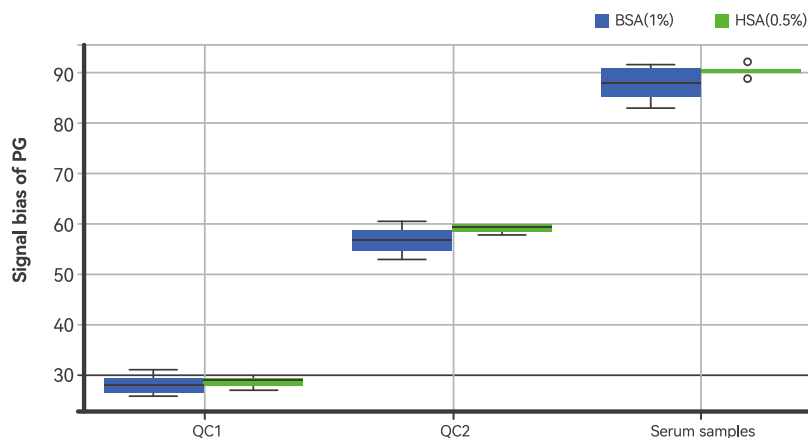


OsrHSA and BSA were added into enzyme-labeled antibody separately, then preserved at 2-8°C for 8 days and 37°C for 8 days.

Compared the the RLU bials from 2-8°C to 37°C of above-mentioned two buffers, the RLU Bials of OsrHSA is lower than BAS, indicating a better stability.

●● Pepsinogen(PG) stabilizer

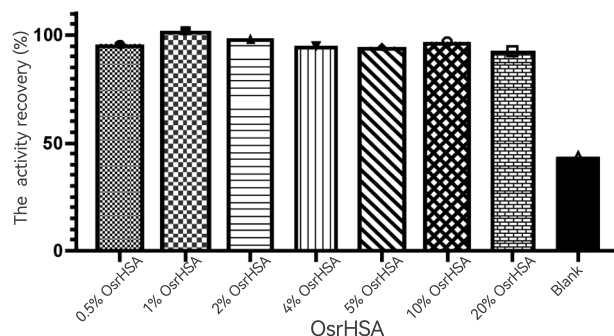
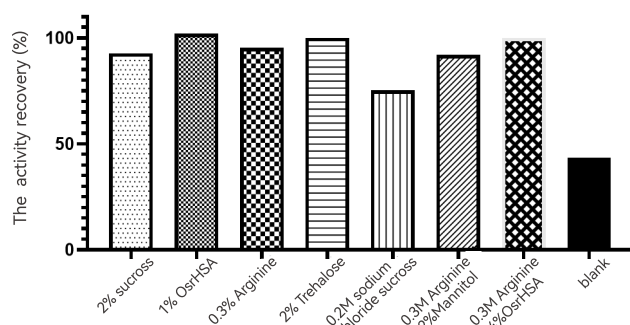
(OsrHSA compared with BSA)



In biochemical project, the value of PG pepsinogen with BSA&OsrHSA were tested separately, from 1 day to 14days. The concentration of BSA is 1% while the concentration of OsrHSA is 0.5%. The results showed that all bias of PG pepsinogen in 0.5% OsrHSA are lower than 1% BSA, indicating that the protective effect of OsrHSA was significantly better than that of BSA.

●● Activity recovery of enzyme protectants

(OsrHSA compared with other protectants)

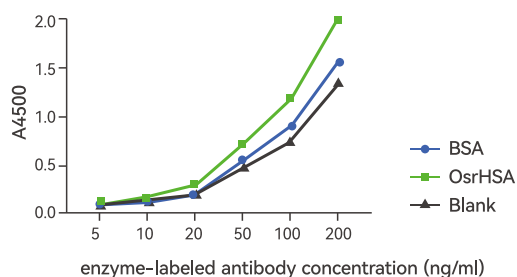


Different kinds of protectants are tested, and OsrHSA shows a highest activity recovery among them. Then different concentrations of OsrHSA was added in enzyme, from 0.5% to 20%. All the activity recovery are more than 90%.

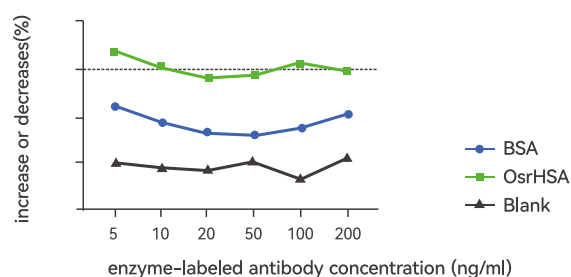
●● Stabilizer for AFP enzyme-labeled antibody

(OsrHSA compared with BSA in different concentration)

The protective effect of OsrHSA on enzyme-labeled antibody(37°C)



The protective effect of OsrHSA on enzyme-labeled antibody(37°C vs 4°C)



OsrHSA and BSA were added into enzyme-labeled antibody separately.

The protective effect of OsrHSA is obviously greater than that of BSA at 37°C.

Compared the the relative change from 4°C to 37°C, the value of enzymatic reaction is within 10%, indicating good stability.

Healthgen'Vision

To become a world-leading biopharmaceutical company, delivering green and safe products to advance human health.

Healthgen'Mission

To deliver green, safe, accessible, and abundant biopharmaceutical products to people worldwide.



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