

HUMANKINE[®] 系列的重组蛋白溶解注意事项

Proteintech 的 HUMANKINE[®] 系列的细胞因子均为冻干粉（仅个别特殊的重组蛋白为液体），冻干粉运输方便，活性稳定，在 -20℃ 或 -80℃ 条件下可以保存数年。用户在进行科学研究时，需要将冻干粉在使用前进行溶解，然后按照一定的浓度，以液体形式加到培养体系或是注射入动物体内。

溶解步骤非常关键，因溶解不当而导致细胞因子失活或是浓度不准确，将会影响用户的实验结果，给科研工作带来困扰。溶解过程中的注意事项，详述如下：

1、开盖前离心试剂管，10000-12000rpm 离心 30s 或 3000-3500rpm 离心 5min。

HUMANKINE[®] 系列的重组蛋白产品中不含有载体蛋白或其他添加剂（如 HSA、BSA 或蔗糖、甘露醇、海藻糖等），通常以最少量的盐来进行冻干处理，盛放于无菌塑料管内，微量的蛋白在冻干过程中会沉积在管壁内，形成很薄或不可见的蛋白膜，冻干粉在运输过程中可能会因颠簸而飘散并粘贴于管壁或管盖上，所以在打开塑料管盖前，需将冻干粉通过离心收集到管底，以使用很小体积的液体即可将冻干粉完全溶解。

2、用无菌水或合适的溶剂重悬至 0.1-1.0mg/mL，不可振荡（溶解关键步骤）。

①. 务必使用说明书中推荐的溶剂来溶解/重悬冻干粉。

常用溶解液有：无菌水；无菌 1XPBS；无菌 10 mM 醋酸；无菌 20% 乙醇 + 50 mM 醋酸钠 + 75 mM 醋酸；无菌 4 mM 盐酸溶液（新鲜配制）。

②. 蛋白的溶解性与很多因素有关，比如 pH 值和离子强度等，说明书上推荐的溶解液均经过严格测试，是能够将该细胞因子或重组蛋白完全溶解的液体。

③. 蛋白在一定的浓度范围内可以保持良好的活性和稳定性。低于或高于该浓度范围，可能会导致蛋白无法完全溶解，甚至出现蛋白质聚集现象，或是活性减弱甚至丧失。

④. 不能用涡旋仪进行快速振荡，一般用移液枪的枪头轻吹几下，即可使细胞因子或重组蛋白完全溶解。有些不易溶解或是溶解缓慢的蛋白质，可以将其放置于水平摇床上低速摇一段时间，或是将重悬液在 4℃ 静置 2 小时以上。对于不易溶解的细胞因子，请参考说明书的溶解方法。

3、保存条件

重悬后的细胞因子或重组蛋白溶液在 2-8℃ 最长可保存一周，如要长期保存，则需用终浓度为 0.1% HSA 或是 0.1% BSA 的缓冲液来稀释，细胞因子浓度不得低于 10 μg/mL，然后分装冻存于 -20℃ 至 -80℃。分装时每管工作液的体积最好是一次实验的用量，以实现每次实验用完一支工作液，避免反复冻融引起蛋白活性的降低。如果实验中不允许含有 HSA 或是 BSA 等人活动物蛋白成分的，可以使用 5% 海藻糖作为保护剂，稀释分装。

MATERIAL SAFETY DATA SHEET (MSDS)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Description: All Recombinant Humankine[®] expressed in Human Cell Line (See products below)

Activin A, beta NGF, BMP-2, BMP-4, BMP-7, Cystatin C, EPO, FGF-4, FGF-7 (KGF), FGF-8b, FGFbasic-TS, FLT3 Ligand, G-CSF, GM-CSF, HGF, HGH, HSA, IFN alpha 2A, IFN alpha 2B, IFN beta, IFN gamma, IL-1 beta, IL-2, IL-3, IL-4, IL-6, IL-7, IL-9, IL-10, IL-12, IL-17 (IL-17A), IL-17F, IL-23, IL-27, IL-28A, IL-28B, IL-29, LEFTY-1, LIF, M-CSF, Noggin, OSM, PDGFaa, PDGFbb, pro IGF-II, Pleiotrophin (PTN), SCF, SHH, TGF beta 1, TGF beta 2, TGF beta 3, TNF alpha, Thrombin, TPO, VEGF121, VEGF165, and Wnt3A.

Company Identification: Proteintech Group, Inc.

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2. COMPOSITION/INFORMATION ON INGREDIENTS

(See Section 8, "Exposure Controls/Personal Protection", for exposure guidelines)

3. HAZARDS IDENTIFICATION AND POTENTIAL HEALTH EFFECTS

EYE CONTACT: May cause eye irritation, including redness, tearing, and possible abrasions.

SKIN CONTACT: May consist of corrosive material and can cause burns and skin irritation.

INHALATION: Inhalation of high concentrations of dust may cause nasal or lung irritation. Inhalation of large quantities can produce gastrointestinal irritation and vomiting.

INGESTION: Material can be irritating to mucous membranes and respiratory tract.

4. FIRST AID MEASURES

EYE CONTACT: Flush eyes with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Then get immediate medical attention.

SKIN CONTACT: Immediately wash with plenty of soap and water for 15 minutes. Remove contaminated clothing.

INHALATION: If inhaled supply fresh air. If breathing becomes difficult call a physician. In case of unconsciousness, place patient on side position for transportation. If not breathing, give artificial respiration.

INGESTION: If swallowed, induce vomiting. Get immediate medical attention. Consult a physician.

5. FIRE FIGHTING MEASURES

Large fires should be fought with water or alcohol resistant foam. Firefighters should wear protective equipment and self-contained breathing apparatus. As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

6. ACCIDENTAL RELEASE MEASURES

Use eye protection, gloves, and apron. Implement appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust.

Clean up: Sweep up, place in bag and hold for disposal. Ventilate area and wash site after material is picked up.

7. HANDLING AND STORAGE

HANDLING: User Exposure: Void inhalation. Avoid contact with eyes, skin, and clothing. Wear personal protective equipment.

STORAGE: Suitable: Keep tightly closed. Store at -80°C. Keep in properly labelled containers.

See product data sheet for more information on handling and storage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION: Safety glasses with side-shields.

SKIN PROTECTION: Wear lightweight protective clothing and gloves that cannot be penetrated by chemicals or oil.

INHALATION: In case of insufficient ventilation wear suitable respiratory equipment.

ENGINEERING CONTROLS: Ensure adequate ventilation, especially in confined areas. Safety shower and eye bath. Mechanical exhaust required.

EXPOSURE GUIDELINES: Wash thoroughly after handling and prevent product from entering drains.

9. CHEMICAL AND PHYSICAL PROPERTIES

PHYSICAL STATE: Solid Lyophilized powder

pH: N/A

BOILING POINT: N/A

MELTING POINT: N/A

DECOMPOSITION TEMP: N/A

SOLUBILITY: N/A

OXIDIZING PROPERTIES: N/A

FLASH POINT: N/A

WATER CONTENT: N/A

10. STABILITY AND REACTIVITY

STABILITY: Non-flammable and Non-explosive. Stable.

CONDITIONS TO AVOID: No information available.

MATERIALS TO AVOID: No information available.

HAZARDOUS DECOMPOSITION: No information available.

HAZARDOUS POLYMERIZATION: Does not spontaneously polymerize.

11. TOXICOLOGICAL INFORMATION

EYE CONTACT: May cause eye irritation.

SKIN CONTACT: May cause skin irritation.

INHALATION: May cause irritation of respiratory tract.

INGESTION: May be harmful if swallowed.

12. ECOLOGICAL INFORMATION

ECOTOXICITY EFFECTS: No information available.

BIODEGRADATION: Inherently biodegradable.

BIOACCUMULATION: Does not bioaccumulate.

MOBILITY: No information available.

13. DISPOSAL INFORMATION

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORTATION INFORMATION

TRANSPORTATION: DOT/IATA/IMDG

Non-hazardous for any form of transportation.

15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006. Safety, health, and environmental regulations/legislation specific for the substance or mixture. No data available Chemical Safety Assessment. For this product a chemical safety assessment was not carried out.

16. OTHER INFORMATION

Disclaimer: For research use only. Not intended for human or animal diagnostic or therapeutic use.

The above information was acquired by diligent search and the recommendations are based on prudent application of professional judgment. All materials and mixtures may present unknown hazards and should be used with caution.

Since the company cannot control the actual methods, volumes, or conditions of use, the company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein.

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If you have questions, or require more information, please email Proteintech-CN@ptglab.com.