Instructions for Use

HumaDerm Insoluble - *Human Skin Collagen Type I, Lyophilized*

For tissue engineering research applications

SKU: SCIL
Tissue Source: Human Skin

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Product Description

Type I Collagen is the most abundant type of collagen in the human body, as a major structural matrix protein in skin, and many other tissues (bone, tendon, and fibrous connective tissues) [1]. There are a number of types of collagen identified to date, and all are composed of molecules containing three polypeptide chains arranged in a triple helical conformation [2]. The types of collagen differ slightly in the primary amino acid sequence of their polypeptide chains. Type I collagen is a heterotrimer composed of one α_2(I) chain and two α_1(I) chains [3].

Various types of cell surface receptors present on diverse types of mammalian cells recognize the collagen triple helix structure and facilitate cell attachment to collagen materials, including films and scaffolds. The most characterized cell receptors are the integrins $\alpha_1\beta_1$ and $\alpha_2\beta_1$ [4]. Many cell types express both forms of integrin, including mesenchymal stem cells (MSCs), fibroblasts, endothelial cells, chondrocytes, osteoblasts, and lymphocytes[3, 5-7]. Smooth muscle cells interact with collagen via $\alpha_1\beta_1$, and epithelial cells attach via $\alpha_2\beta_1$ [8, 9]. Collagen type I is characterized by the presence of three regions on SDS-PAGE corresponding to molecular weights. Alpha region has a molecular weight of 100 KDa and consists of two α_1 chains and one α_2 chain. Beta region has a molecular weight of 200 KDa and consists of two α_1 chains fused together and α_1 α_2 chains fused together. Gamma region has a molecular weight of 300 KDa and consists of overlapping two α_1 and one α_2 chains**. HumaDerm Insoluble** has all three regions and chains with very minimal fragmented proteins in between. **HumaDerm Insoluble** can be used to make scaffolds for 3D tissue engineering applications.

Source Tissue

Type I collagen is isolated from human skin sourced strictly from American Association of Tissue Banks (AATB) accredited and FDA registered tissue banks and organ procurement organizations (OPOs). Humabiologics strives to meet research needs by providing high quality biomaterials obtained from tissue partners who comply with requirements for transplantable human tissues under 21 CFR 1271 of the Food and Drug Administration (FDA).

Precautions and Disclaimer

HumaDerm Insoluble is obtained from human tissue that has been tested and found negative for minimum of HIV-1 and -2, hepatitis B, and hepatitis C, as well as other infectious agents. Please review the Safety Data Sheet (SDS) for information regarding hazards and safe handling practices. ***HumaDerm Insoluble is for research use only and is not intended for human use, diagnosis, screening, household, food or other uses.***

Storage

HumaDerm Insoluble should be stored at -20 °C upon receipt. The expiration date is 1 year from receipt of the bottle. Collagen is a stable protein if it is stored frozen while minimizing freeze-thaw cycles.

Insoluble Collagen – Suggested Instructions for Use

Note: The following are general recommendations. Researcher should optimize parameters based on their specific applications

1. Weigh out desired amount of insoluble collagen.
2. Add collagen to cold water.
   Note: Adding acid will change solution viscosity and help with homogenization.
3. Mix the collagen solution until the collagen is fully hydrated.
4. Bring the solution to a homogenous form. Ensure that the temperature stays less than 30 °C during the homogenization process.
5. Remove bubbles through quick centrifuge or stirring under vacuum.
6. The solution can then be used as needed or frozen and lyophilized to form a scaffold.

References

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