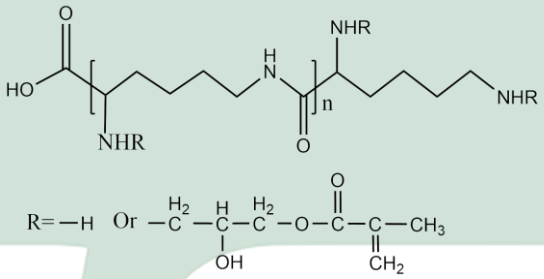
Poly-L-lysine Methacryloyl（PLMA）

Product component

Item	character	Package Size	Notes
A： PLMA	White powder	0.5 g/ bottle	Keep in dark
B： Photoinitiator LAP	White powder	0.025 g/ bottle	

This instruction applies to EFL-PLMA-001



PLMA molecular structure

product introduction

Polylysine (ε-PL) is an antibacterial polypeptide (AMP) produced by Streptomyces. It has universal antibacterial activity against both bacteria and fungi, such as Escherichia coli (E.coli) and Staphylococcus aureus (S.aureus). With good biocompatibility, antibacterial and degradable properties, ε-PL and its derivatives are widely used in the field of tissue engineering such as antibacterial wound dressings. It not only promotes tissue repair, but also avoids the disadvantages of traditional antibacterial drugs or metal ions (e.g. Ag+), such as undesirable side effects and poor drug resistance.

Poly-L-lysine Methacryloyl (PLMA) is a double bond modified poly-lysine which can be cured by UV and visible light in the presence of photo-initiators. The EFL team introduce a PLMA product (EFL-PLMA series) with stable physicochemical properties. It can be cured into gel within 10 seconds under visible light. The material is biocompatible, antimicrobial and offers a wide range of viscoelastic properties to suit different applications.

Applications

Antibacterial coatings, wound dressings, etc.

Storage

Dry kit： 4℃, 12 months; -20℃, 18 months. **Please note that repeated freezing and thawing of the solution will affect the performance of the product, so it is best to prepare it when using it.**

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period of validity

The date of manufacture is shown in the package。

Scan the QR code on the right for more information

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Solution preparation

1. Prepare 0.25% (w/v) standard solution of initiator

(1) Add 10ml PBS into the brown bottle containing initiator LAP (containing 0.025g LAP);

(2) Heat and dissolve the solution in a water bath at 40-50℃ for 15 minutes, shaking several times.

The LAP standard solution can be stored for 12 months at 4°C in dark.

2. Prepare PLMA solution (Use it after restoring to room temperature and keep the bottle tightly capped after use to avoid moisture absorption and deterioration of the reagent) (10-25 % (w/v) is recommended)

(1) Take the required mass of PLMA into the centrifugal tube (Weigh PLMA in the centrifuge tube to avoid sticking to the weighing paper);

(2) Add the required volume of initiator standard solution to the above container;

(3) Dissolve by shaking and stirring at room temperature for 0.5-1h;

- PLMA-001 shows low viscosity and can be dissolved by shaking in a centrifuge tube;
- Centrifugation is recommended to remove air bubbles from the system (3000-5000 rpm);

(4) Sterilise the PLMA solution by using a 0.22μm sterile needle filter and store it in dark.

Antimicrobial resistance tests

Antibacterial hydrogel ratio：**pure PLMA hydrogel (PLMA: 10-25% (w/v)) or composite gel (PLMA 2-5% (w/v))**

Taking the coated plate method as an example, the antibacterial experiment suggestions are as follows: (96-well plate: 50-100 μL/ well, 48-well plate: 100-300 μL/ well, 24-well plate: 300-500 μL/ well)

- Add 10-20μL bacterial suspension to the fully gelated gel (405nm, 30s) surface, gently shook to make the bacterial solution evenly dispersed on the gel surface, and then

cultured in a 37℃ incubator for 2h;

- After incubation, 500μL of 0.01M PBS was added to the well plate to resuspend the bacteria. Take 100μL of the diluted bacterial suspension for plate coating (nutrient agar pre-coated dishes), 37°C, incubate for 18~24h;
- Photo shooting and counting, calculation of antibacterial rate. Change medium, observe, and photograph according to experimental design. (No special requirements for operation procedures).

Biocompatibility test

Recommended for use in combination with other types of hydrogels: combination concentration of PLMA ≤5 % (w/v)

(96-well plate: 50-100 μL/ well, 48-well plate: 100-300 μL/ well, 24-well plate: 300-500 μL/ well)

- Irradiate the wells with 405 nm light for 10-30 seconds to gelate, the gel strength can be adjusted by the time and intensity of the light;
- Add the medium to the wells to cover the gel and incubate in a 37°C incubator for **24h(during which time the medium was changed 2-3 times).** Then wash samples and remove the medium;
- Add the cell suspension to the wells of the plate and **change the solution after cell attachment and the next day of culture.** Change medium, observe, and photograph according to experimental design. (No special requirements for operation procedures).

Note: When PLMA is mixed with other type of hydrogels, which has negatively charged, there will be precipitation and gelation caused by electrostatic action under a certain proportion. This is a normal phenomenon, it is recommended to adjust the solution ratio.

Tips: Do not look directly at the light source.