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UTILISING CHITINASE TO REDUCE FUNGAL INDUCED ILLNESSES

By Thinker - Shenzhen

HOW WE CREATE CHITINASE:

First of all, we used DNA synthesis technology to obtain the target fragment and stored it in the prepared PMD18T-INSERT plasmid. Then PCR amplification was performed to obtain a large number of target fragments.

1



2



Then, EcoRI and XhoI were used to double digestion pSB1A3-MRFP and the amplified target fragment, introducing the restriction site to generate the sticky end.

3

We carried out electrophoresis technology to obtain pSB1A3-MRFP carrier fragment and DNA gel. The plasmid pSB1A3- target fragment was generated by linking the prepared vector fragment with the target fragment, and then we introduced pSB1A3- target fragment into DH5 receptor cells.



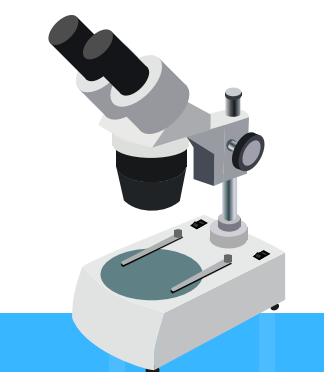
4

After PCR amplification and electrophoresis, the staining agent that could stay between the double strands of DNA was added into the gel, and uv gelling was carried out.



5

If obvious fluorescence could be seen, the target fragment was successfully inserted into pSB1A3-MRFP. Then, the plasmid was extracted from DH5 and imported into BL21. The experiment was completed.



TYPES OF FUNGAL SKIN DISEASES:

Fungi live everywhere. They can be found in plants, soil, and even on your skin. Although there are millions of species of fungi, only about 300 of them can actually cause skin infections in humans. There are several types of fungal infections that can affect your skin:

1. Tinea Pedis (Athlete's foot)

A fungal infection that affects the skin on your feet, often between your toes. Typical symptoms of athlete's foot include:

1. itching, or a burning, stinging sensation between your toes or on the soles of your feet
2. skin that appears red, scaly, dry, or flaky
3. cracked or blistered skin



1



2

2. Tinea Cruris (Jock itch)

A fungal skin infection that happens in the area of people's groin and thighs and is most common in men and adolescent boys.

The main symptom is an itchy red rash that typically starts in the groin area or around the upper inner thighs.

3. Cutaneous Candidiasis

A skin infection that's caused by Candida fungi. This type of fungi is naturally present on and inside our bodies. Candida skin infections occur in areas that are warm, moist, and poorly ventilated.

The symptoms of a Candida infection of the skin can include:

1. a red rash
2. itching
3. small red pustules

4. Tinea Unguium (Onychomycosis)

A fungal infection of your nails. It can affect the fingernails or the toenails, although infections of the toenails are more common. Prescription medications are often required to treat this type of infection. In severe cases, your doctor may remove some or all of an affected nail.

HOW DOES CHITINASE REDUCE ILLNESSES?

1. 我们首先运用DNA合成技术获取目的片段，放入已准备好的pMD18T-insert质粒中保存，接着对其进行PCR扩增获得大量目的片段



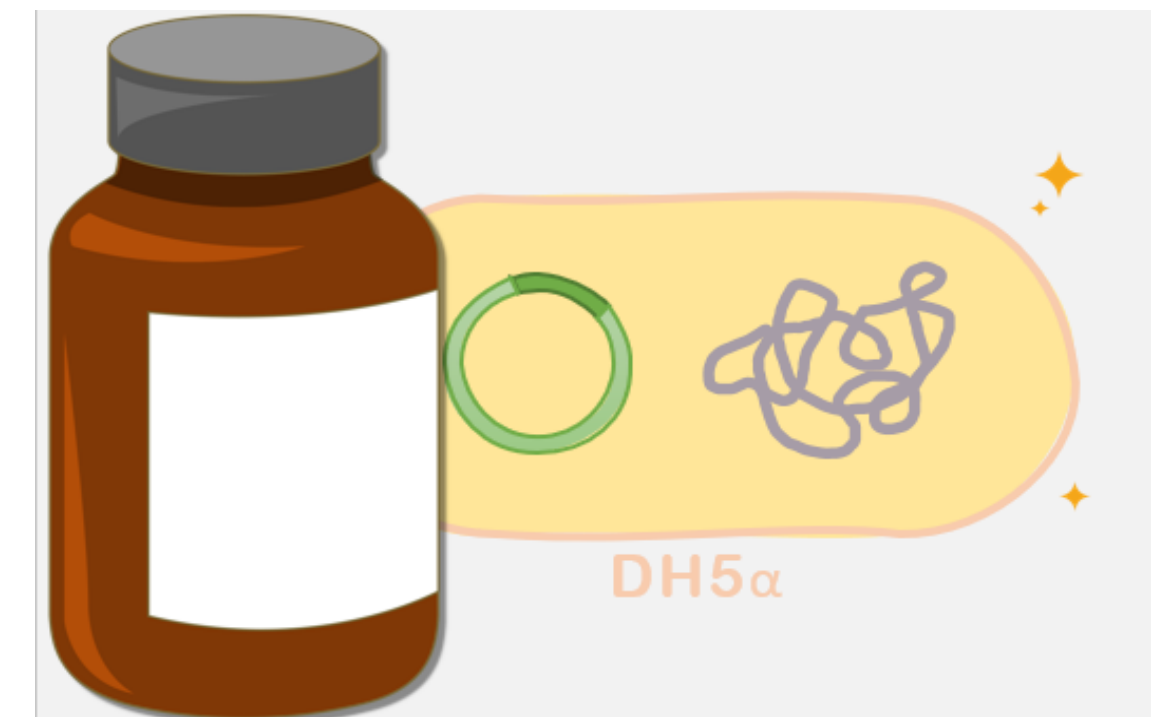
HOW WE CREATE CHITINASE:

2. 用EcoRI和XhoI对pSB1A3-mRFP和扩增后的目的片段进行双酶切引入酶切位点产生粘性末端，利用电泳技术获得pSB1A3-mRFP载体片段和DNA凝胶



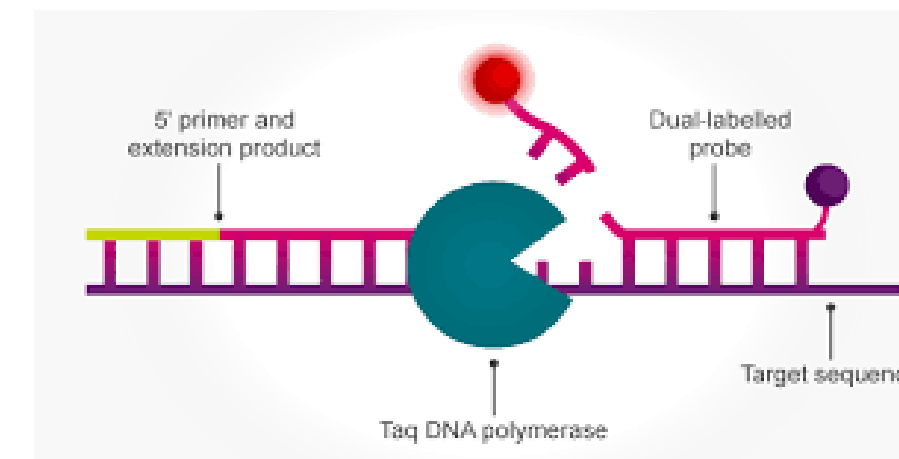
HOW WE CREATE CHITINASE:

3. 将制备好的载体片段与目的片段进行连接生成pSB1A3-目的片段质粒，冰浴水浴交替将pSB1A3-目的片段导入DH5感受态细胞中

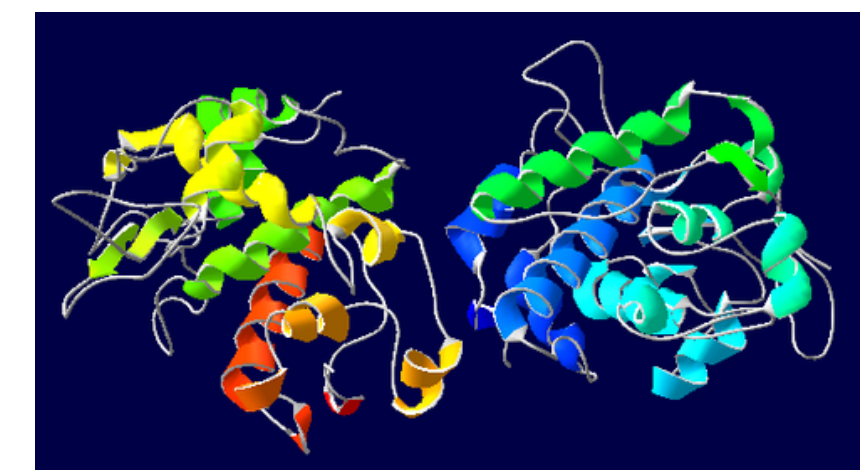


HOW WE CREATE CHITINASE:

4. 利用Taq酶一半菌落进行PCR扩增并进行电泳，在凝胶中加入可以停留在DNA双链之间的染色剂，进行紫外线照胶，若能看到明显的荧光则证明我们成功在pSB1A3-mRFP中插入了目的片段，然后对DH5进行扩大培养，最后从DH5中提取质粒并导入到BL21中，完成实验。



WHAT IS CHITINASE?



Chitinase is an enzyme that breaks down chitin into chitin monosaccharides, n-acetyl-glucose. Chitin, also known as chitin or chitin, is the cell wall component of most fungi and one of the limiting factors for effective control of fungal diseases. Because chitinase can degrade fungal cell wall material, it has potential application prospect in the prevention and control of fungal diseases. There are many diseases caused by fungi, such as tinea pedis, tinea femoris and tinea capitis caused by cutaneous fungal diseases, tinea versicolor and trichosarcoidosis caused by superficial fungal diseases, sporohyphomycosis and blastomycosis caused by subcutaneous fungal diseases. There are many kinds of fungal treatment methods. The anti-fungal method of chitinase is quite efficient, and the main research of our team is to use the anti-fungal method of chitinase to treat fungal diseases for humans. Chitin is the main component of the cell wall of most fungi, and chitinase can hydrolyze chitin in the cell wall of fungi, thus affecting and blocking the growth of fungi, so as to play a safe and effective role in antifungal.