Document 0739

[20739001]

A potentially safer whooping cough vaccine made by novel genetic engineering techniques was described by a team of Italian , U.S. and Japanese scientists .

_ _ _ _ _ _ ev-w1923f6 _ _ _ _ _ _ ev-w894f2 _ _ _ _ _ _ _ _ _ _ _ _

[20739002]

The team reported they managed to induce bacteria to produce a non-toxic version of the poisons produced by the bacterium that causes whooping cough .

_ _ ev-w2671f1 _ ev-w1930f1 _ ev-w1686f2 _ _ ev-w2396f1 _ _ _ _ _ _ ev-w2396f1 _ _ _ _ ev-w467f1 _ _ _

[20739003]

Laboratory tests showed that non-toxic versions of the poisons are capable of inducing an immunity to whooping cough , the researchers reported in this week 's issue of the journal Science .

_ _ ev-w2945f1 _ _ _ _ _ _ ev-w218f2 _ _ ev-w1686f1 _ _ _ _ _ _ _ _ ev-w2671f1 _ _ _ _ _ _ _ _ _ _

[20739006]

The vaccine , however , causes allergic reactions that can be fatal .

_ _ _ _ _ ev-w467f1 _ _ _ _ ev-w218f2 _ _

[20739007]

The reactions stem from the fact that the vaccine contains multiple copies of the whole Bordetella pertussis bacterium , which causes whooping cough .

_ _ ev-w3163f1 _ _ _ _ _ _ ev-w678f1 _ _ _ _ _ _ _ _ _ _ ev-w467f1 _ _ _

[20739008]

This bacterium produces a toxin that , if used as a vaccine , can induce immunity to whooping cough .

_ _ ev-w2396f1 _ _ _ _ _ ev-w3525f6 _ _ _ _ _ ev-w1686f1 _ _ _ _ _

[20739009]

Unfortunately , the toxin is also poisonous .

_ _ _ _ ev-w218f2 _ _ _

[20739010]

The Italian-led scientific team said they had succeeded in getting bacteria to produce a non-toxic version of the pertussis toxin , which could be used as a safe vaccine .

_ _ _ _ ev-w2833f1 _ _ ev-w3245f3 _ ev-w1455f3 _ _ ev-w2396f1 _ _ _ _ _ _ _ _ _ _ _ ev-w3525f6 _ _ _ _ _

[20739011]

The researchers reported they have been able to pluck the five genes that produced the toxin out of the pertussis bacterium .

_ _ ev-w2671f1 _ _ ev-w218f2 _ _ ev-w2304f1 _ _ _ _ ev-w2396f1 _ _ _ _ _ _ _ _

[20739012]

It turned out that although it took all five genes to produce the toxin , only one was responsible for the toxin 's virulence .

_ ev-w3472f4_u_nobody _ _ _ _ ev-w3310f56 _ _ _ _ ev-w2396f1 _ _ _ _ _ ev-w218f2 _ _ _ _ _ _ _

[20739014]

The researchers said they did this , but the toxin did n't induce immunity to whooping cough .

_ _ ev-w2833f1 _ ev-w1029f2 _ _ _ _ _ _ _ ev-w1686f1 _ _ _ _ _

[20739015]

The scientists then took the five toxin genes and triggered a mutation in the one gene that caused virulence .

_ _ _ ev-w3310f50_u_nobody _ _ _ _ _ ev-w3448f1 _ _ _ _ _ _ _ ev-w467f1 _ _

[20739016]

Then , using a new technique (called homologous recombination) for introducing genes into cells , they transferred all five genes to bacteria closely related to the pertussis organism .

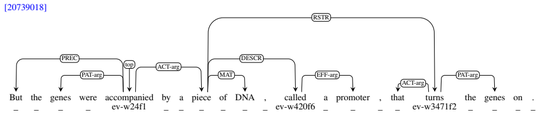
_ _ ev-w3525f6 _ _ _ _ ev-w420f6 _ _ _ _ ev-w1745f2 _ _ _ _ _ ev-w3427f1 _ _ _ _ _ _ _ _ _ _ _ _

[20739017]

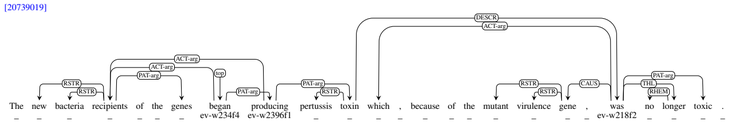
These bacterial “ cousins ” ordinarily do n't make the toxin .

_ _ _ _ _ _ _ _ ev-w1923f6 _ _ _

[20739018]



[20739019]



[20739020]