CLAIMS

~~1. A GDSL lipase, wherein its amino acid sequence is as shown in SEQ ID NO.2.~~

~~2. A gene encoding the GDSL lipase as in claim 1.~~

~~3. The gene according to claim 2, wherein its nucleotide sequence is as shown in SEQ ID NO.1~~

~~4~~1. A recombinant vector containing ~~the~~ a gene ~~as in claim 3~~ encoding a GDSL lipase, wherein said gene having a nucleotide sequence as shown in SEQ ID NO.1 and wherein said GDSL lipase having a nucleotide sequence as shown in SEQ ID NO.1.

~~5~~2. The recombinant vector according to claim ~~4~~1, wherein its expression vector is pET 32a(+).

~~6~~3. An engineered bacterium containing the recombinant vector as in claim ~~5~~2.

~~7~~4. The engineered bacterium according to claim ~~6~~3, wherein the host cell is *E.coli* BL21(DE3).

~~8~~5. An application of the engineered bacterium as in claim ~~6~~ 3 or ~~7~~ 4 in the production of vitamin A palmitate, including:

(1) inoculating the engineered bacterium to an LB medium for seed culture;

(2) transferring the seed solution to a fermentation medium for fermentation culture, and then adding an inducer to induce expression of enzymes;

(3) centrifuging the fermentation broth to obtain a supernate, and obtaining enzyme powder through precipitation by ammonium sulfate and lyophilization; and

(4) adding the enzyme powder to an organic phase system containing vitamin A and palmitic acid to produce vitamin A palmitate.

~~9~~6. The application according to claim ~~8~~5, wherein the fermentation medium comprises:

tryptone 10g/L, yeast powder 5g/L, NaCl 10g/L, $MgSO_4 \cdot 7H_2O$ 1g/L, KH_2PO_4

0.5g/L, K_2HPO_4 0.5g/L, olive oil emulsion 12mL/L, and distilled water added till volume 1L.

~~10~~7. The application according to claim ~~9~~6, wherein the olive oil emulsion is prepared by the following method: mixing olive oil emulsifier PVA with olive oil at a volume ratio of 3:1 and emulsifying the mixture by ultrasound.