

Claims

1. Method for the activation of immune cells by incubating them with at least one short-chain fatty acid so that the immune cells are activated so that they can increase the production of effector molecules.
- 5 2. Method according to claim 1 characterized in that the immune cells are T cells.
3. Method according to claim 2 characterized in that the immune cells are NK cells, $\gamma\delta$ T cells, B lymphocytes, NK T cells.
4. Method according to claim 2 characterized in that the immune cells are CD8⁺ cytotoxic T lymphocytes (CTLs) or chimeric antigen receptor (CAR) T cells.
- 10 5. Method according to claim 1 to 4 characterized in that the short-chain fatty acid comprises pentanoate or a pharmaceutical acceptable derivative thereof.
6. Method according to claim 1 to 5 characterized in that the short-chain fatty acid comprises pentanoate and butyrate or pharmaceutical acceptable compositions thereof.
- 15 7. Method according to claim 1 to 6 characterized in that the at least one short-chain fatty acid is produced by at least one species of bacteria.
8. Method according to claim 7 characterized in that the at least one short-chain fatty acid is produced by the bacterium *Megasphaera massiliensis*.
- 20 9. Method according to claim 7 and 8 characterized in that the at least one short-chain fatty acid is produced by a group of bacteria comprising at least the bacteria *Megasphaera massiliensis*, *Megasphaera elsdenii*, *Faecalibacterium prausnitzii* and *Anaerostipes hadrus*.
- 25 10. Use of the activated immune cells according to one of the claims 1 to 9 for the treatment of tumors, immune mediated diseases, degenerative diseases and infectious diseases characterized in that the at least one short-chain fatty acid enhances a cellular immune therapy.
- 30 11. Use of the activated immune cells according to one of the claims 1 to 9 for the treatment of tumors, immune mediated diseases, degenerative diseases and infectious diseases characterized in that the tumor is a pancreatic tumor.

12. Method for the cultivation of T cells by incubating them with short-chain fatty acid pentanoate so that the T cells are activated and the production of effector molecules is increased.

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