**Table S1.** 16 media were designed based on the auto-induction medium ZYP-5052 for improving the accumulation of TAG rich in medium-chain fatty acid (MCFA).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | N-Z-amine | glycerol | MgSO4 | (NH4)2SO4 | Aspartic acid + Serine | Yeast extract | Na2HPO4 | KH2PO4 | Glucose | Lactose | Trace metalsa |
|  | (%) | (%) | (mM) | (mM) | (%) | (%) | (mM) | (mM) | (%) | (%) |  |
| ZYP-5052 | 1 | 0.5 | 2 | 25 | 0 | 0.5 | 50 | 50 | 0.05 | 0.2 | 0.2× |
| 1 | 1 | 2 | 0.2 | 5 | 0.1 | - | - | - | - | - | - |
| 2 | 1 | 3 | 1 | 10 | 0.2 | - | - | - | - | - | - |
| 3 | 1 | 4 | 2 | 20 | 0.3 | - | - | - | - | - | - |
| 4 | 1 | 5 | 3 | 25 | 0.5 | - | - | - | - | - | - |
| 5 | 2 | 2 | 2 | 10 | 0.5 | - | - | - | - | - | - |
| 6 | 2 | 3 | 3 | 5 | 0.3 | - | - | - | - | - | - |
| 7 | 2 | 4 | 0.2 | 25 | 0.2 | - | - | - | - | - | - |
| 8 | 2 | 5 | 1 | 20 | 0.1 | - | - | - | - | - | - |
| 9 | 3 | 2 | 3 | 20 | 0.2 | - | - | - | - | - | - |
| 10 | 3 | 3 | 2 | 25 | 0.1 | - | - | - | - | - | - |
| 11 | 3 | 4 | 1 | 5 | 0.5 | - | - | - | - | - | - |
| 12 | 3 | 5 | 0.2 | 10 | 0.3 | - | - | - | - | - | - |
| 13 | 4 | 2 | 1 | 25 | 0.3 | - | - | - | - | - | - |
| 14 | 4 | 3 | 0.2 | 20 | 0.5 | - | - | - | - | - | - |
| 15 | 4 | 4 | 3 | 10 | 0.1 | - | - | - | - | - | - |
| 16 | 4 | 5 | 2 | 5 | 0.2 | - | - | - | - | - | - |

aA stock solution of 0.1 M FeCl3 was dissolved in a 100-fold dilution of concentrated HCl (final concentration 0.12 M HCl). This solution was combined with autoclaved stock solutions of other metals to make a 1000× trace metal mixture containing 50 mM FeCl3, 20 mM CaCl2, 10 mM each of MnCl2 and ZnSO4, and 2 mM each of CoCl2, CuCl2, NiCl2, Na2MoO4, Na2SeO3, and H3BO3 in 60 mM HCl. These solutions were stored at room temperature. Upon prolonged storage, small amounts of precipitate formed in the mixture.