What is claimed is:

1. A method for producing one or more cannabinoids, the method comprising contacting cannabigerolic acid (CBGA) with a cannabinoid synthase orthologue, wherein the orthologue includes an amino acid sequence selected from the group consisting of SEQ ID NOs: 16, 23, 47, 57, 87, 107 and 117 and wherein the cannabinoids produced have a formula weight of 358.5 g/mol, 374.5 g/mol, or 330.5 g/mol.

2. The method of claim 1, wherein the cannabinoids produced include cannabielsoic acid and cannabielsoin.

3. The method of claim 1, wherein the cannabinoid synthase orthologue is a recombinant enzyme produced in *Saccharomyces cerevisiae*, *Yarrowia lipolytica*, *Kluyveromyces marxianus*, or *Pichia pastoris*.

4. A recombinant cell of *Saccharomyces cerevisiae* or *Pichia pastoris*, comprising in its genome a nucleic acid encoding a cannabinoid synthase orthologue, wherein the cannabinoid synthase orthologue includes an amino acid sequence selected from the group consisting of SEQ ID NOs: 16, 23, 47, 57, 87, 107 and 117, and the cannabinoid synthase orthologue is expressed in the recombinant cell in an active form.

5. The recombinant cell of claim 4, wherein the cannabinoid synthase orthologue is operable to produce cannabinoids having a formula weight of 358.5 g/mol, 374.5 g/mol, or 330.5 g/mol when contacted with cannabigerolic acid (CBGA).

6. The recombinant cell of claim 4, wherein the cannabinoid synthase orthologue is operable to produce cannabinoids including cannabielsoic acid and cannabielsoin when contacted with cannabigerolic acid (CBGA).