Claims

1. A dry powder or dry, granulated cell culture medium comprising at least one alpha keto acid out of the group of 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and alpha keto gamma methylthiobutyric acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters.

2. A dry powder or dry, granulated cell culture medium according to claim 1, whereby the one or more alpha keto acids out of the group of 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and alpha keto gamma methylthiobutyric acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters are present in an amount so that the concentration in the liquid medium obtained after dissolution of the dry powder or dry, granulated cell culture medium for each of the alpha keto acids is above 10 mM.

3. A dry powder or dry, granulated cell culture medium according to claim 1 or claim 2, whereby the dry powder or dry, granulated cell culture medium does not comprise the corresponding amino acid.

4. A dry powder or dry, granulated cell culture medium according to one or more of claims 1 to 3, whereby the medium comprises the sodium salt of one or more of the alpha keto acids out of the group of 4-

Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and alpha keto gamma methylthiobutyric acid.

5. A dry powder or dry, granulated cell culture medium according to one or more of claims 1 to 4, whereby, the dry powder or dry, granulated cell culture medium comprises one or more of the sodium salt of the alpha keto acids selected from 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid and/or alpha-ketoisovaleric acid.

6. A method for producing a dry powder cell culture medium according to one or more of claims 1 to 5 by
   a) mixing at least one alpha keto acid out of the group of 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and alpha keto gamma methylthiobutyric acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters with the other components of the cell culture medium
   b) subjecting the mixture of step a) to milling.

7. A process for culturing cells by
a) providing a bioreactor
b) mixing the cells to be cultured with a liquid cell culture medium prepared by dissolving a dry powder or dry, granulated medium according to one or more of claims 1 to 5 in a solvent
c) incubating the mixture of step b).

8. A fed batch process for culturing cells in a bioreactor by
   - Filling into a bioreactor cells and an aqueous cell culture medium

- Incubating the cells in the bioreactor
- Continuously over whole time of the incubation of the cells in the bioreactor or once or several times within said incubation time adding a cell culture medium, which is in this case a feed medium, to the bioreactor

whereby the feed medium is prepared by dissolving a dry powder or dry, granulated medium according to one or more of claims 1 to 5 in a solvent.

9. Fed batch process according to claim 8, whereby the feed medium comprises at least 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid and/or salts thereof in a concentration between 12 and 600 mmol/l.

10. A method for stabilizing a liquid cell culture medium comprising including in the medium at least 20 mM 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and/or alpha keto gamma methylthiobutyric acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters and whereby the resulting medium shows less color change and/or less precipitation upon storage over 90 days at 4°C or at room temperature compared to a medium of the otherwise same composition which lacks the 4-Methyl-2-oxopentanoic acid and/or 3-methyl-2-oxopentanoic acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters or in which the 4-Methyl-2-oxopentanoic acid and/or 3-methyl-2-oxopentanoic acid and/or metal

salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters have been substituted by corresponding amino acids and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters.

11. A method for improving the solubility of a dry powder or dry, granulated cell culture medium by fully or partially substituting one or more of the amino acids isoleucine, leucine, valine, phenylalanine and methionine by the corresponding keto acid selected from the group of 4-Methyl-2-oxopentanoic acid, 3-methyl-2-oxopentanoic acid, alpha-ketoisovaleric acid, phenylpyruvic acid and alpha keto gamma methylthiobutyric acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters.

12. Method according to claim 11, whereby at least 50% (molar ratio) of the respective amino acid is substituted by the corresponding alpha keto acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters.

13. Method according to claims 11 or 12, whereby the method involves providing the dry powder or dry, granulated cell culture medium in which compared to the original composition at least 50% (molar ratio) of the respective amino acid is substituted by the corresponding alpha keto acid and/or metal salt derivatives selected from the sodium, potassium, calcium or magnesium salt, peptide derivatives in which one, two or three amino acids are linked to the keto acid via a peptidic bond as well as ester derivatives in which the carboxylic acid of the keto acid forms alkyl or aryl esters and dissolving said medium in a solvent whereby dissolution occurs faster and/or in less of the solvent compared to a medium of the original composition which is the otherwise identical composition in which the amino acids have not been substituted.