CLAIMS

1. A process for preparing a powder solid dispersion comprising quercetin, phospholipids and a carrier that is very soluble to freely soluble in water and that is selected from the group consisting of mono- and di-saccharides; polyalcohols; soluble oligo- and poly-saccharides, said process comprising dissolving or suspending in an organic solvent containing less than 5% wt of water and under heating quercetin, phospholipids and the carrier and then removing the solvent to obtain the powder solid dispersion, wherein the process does not comprise any steps of dissolution in water.

2. The process according to claim 1, which comprises the following steps:

a) preparing a solution of quercetin in an organic solvent comprising less than 5%wt water;

b) preparing a solution/suspension of phospholipids in the same solvent used in step a);

c) reacting a solution of quercetin obtained in step a) with a solution/suspension of phospholipids obtained in step b);

d) adding the carrier to the mixture obtained in step c) and

e) removing the solvent under vacuum or under spray-drying to form a powder solid dispersion.

3. The process according to claim 2 wherein steps a) to d) are carried out at a temperature ranging from 40°C to 80°C.

4. The process according to claim 1 or 2 which comprises the following steps:

a-1) preparing a solution of quercetin in an organic solvent comprising less than 5% wt. water [solution (S1)];

b-1) adding phospholipids and the carrier to solution (S1) to provide a solution or suspension of quercetin, phospholipids and carrier in the solvent [solution or suspension (S3)] and

c-1) removing the solvent under vacuum or under spray-drying to form a powder solid dispersion.

5. The process according to claim 4, wherein steps a1) and b1) are carried out at a temperature ranging from 40°C to 80°C.

6. The process according to claims 1 to 5, wherein the quercetin to phospholipids weight ratio ranges from 5:1 to 1:1.

7. The powder solid dispersion according to claim 6, wherein the quercetin to phospholipids weight ratio ranges from 2:1 to 1:1.

8. The process according to claims 1 to 7, wherein quercetin is quercetin dihydrate.

9. The process according to claims 1 to 8, wherein the phospholipids are selected from the group consisting of lecithins from soy, sunflower or egg, phosphatidyl choline, phosphatidyl serine, phosphatidyl ethanolamine, or their mixtures, wherein the acyl groups, which are the same or different, are mostly derived from palmitic, stearic, oleic, linoleic, linolenic acids.

10. The process according to claims 1 to 9, wherein the mono- and di-saccharides are selected from the group consisting of sucrose, fructose, maltodextrins.

11. The process according to claims 1 to 10, wherein the polyalcohols are selected from the group consisting of mannitol, sorbitol, xylitol.

12. The process according to claims 1 to 11, wherein the soluble oligo- and poly-saccharides are dextran or pullulan.

13. The process according to claims 1 to 12, wherein the quercetin to carrier weight ratio ranges from 1:5 to 5:1.

14. The process according to claim 13, wherein the quercetin to carrier weight ratio ranges from 1:2 to 3:1.

15. The process according to any one of claims 1 to 14, wherein the organic solvent is selected form the group consisting of ethyl alcohol, isopropyl alcohol, n-propyl alcohol, n-butanol, ethyl acetate, acetone.

16. A powder solid dispersion comprising quercetin, phospholipids and a carrier very soluble to freely soluble in water obtainable with a process according to any one of claims 1 to 15.

17. The powder solid dispersion according to claim 16, having an average particle size distribution ranging from 100 μm to 300 μm.

18. The powder solid dispersion according to claim 16 or 17, characterized by an X-ray diffraction pattern having peaks at 8.9±0.2, 13.5±0.2, 26.0±0.2 and 27.8±0.2 2θ angle (CuKα λ=1.5419Å).

19. Formulation for oral administration comprising a powder solid dispersion according to claims 16-18 and one or more pharmaceutically and food acceptable excipients.