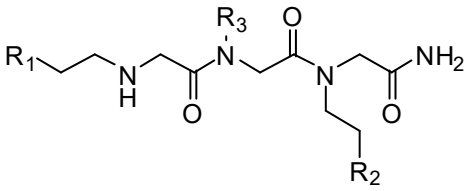
Claims

[Claim 1] A process for synthesizing a compound of formula FI:



(FI)

wherein:

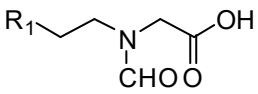
R_1 is phenyl substituted with halogen or trifluoromethyl, and further optionally substituted with one or two substituents selected from the group consisting of halogen, (C_1-C_6)alkyl, (C_1-C_6)alkoxy, and halo(C_1-C_6)alkyl; or alternatively R_1 is pyrrolidin-1-yl;

R_2 is 2-oxo-pyrrolidin-1-ylmethyl or sulfamoylphenyl; and

R_3 is chosen from propyl, 1-methylethyl, butyl, 2-methylpropyl, pentyl, 1 -methyl-butyl, 2- methylbutyl, hexyl, 4-methylpentyl, 3-methylpentyl, 2-methylpentyl, and 1- methylpentyl;

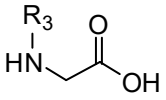
comprising the steps of:

(S1) Providing a compound CS1 of formula FCS1:



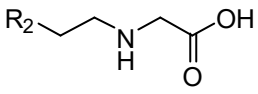
FCS1

(S2) Providing a compound CS2 of formula FCS2:



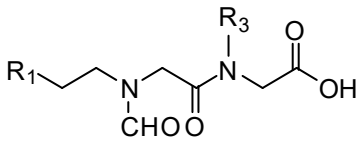
FCS2

(S3) Providing a compound CS3 of formula FCS3:



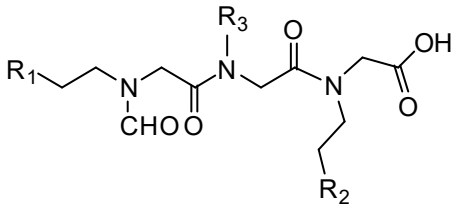
FCS3

(S4) Reacting CS1 with CS2 in an organic solvent resulting in a compound CS4 of formula FCS4:



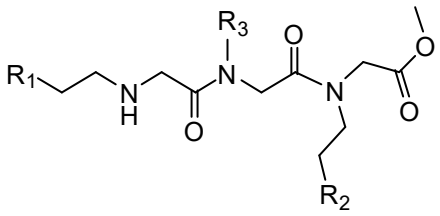
FCS4

(S5) Reacting CS3 with CS4 in an organic solvent resulting in a compound CS5 of formula FCS5:



FCS5

(S6) Reacting CS5 with an acid in an alcoholic solvent resulting in a compound CS6 of formula FCS6:



FCS6

(S7) Reacting CS6 with ammonia in an organic solvent.

[Claim 2] Process according to claim 1, wherein step (S1) is carried out in water at a temperature between 65°C and 90°C, preferably between 70°C and 85°C and more preferably about 80°C.

[Claim 3] Process according to claim 1, wherein step (S2) is carried out in water at a temperature between 65°C and 90°C, preferably between 70°C and 85°C and more preferably of 80°C, and then in concentrated HCl at a temperature of 80°C or above, preferably 90°C or above and more preferably of 100°C.

[Claim 4] Process according to claim 1, wherein step (S3) is carried out in water at a temperature between 65°C and 90°C, preferably between 70°C and 85°C and more preferably of 80°C, and then in concentrated HCl at a temperature of 80°C or above, preferably 90°C or above and more preferably of 100°C.

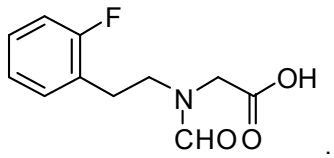
[Claim 5] Process according to claim 1, wherein step (S4) is carried out at a temperature starting at 0°C to room temperature between 20°C and 25°C in the presence of 2,3,4,6,7,8,9,10-octahydropyrimido[1,2-a]azepine and carbonyldiimidazole.

[Claim 6] Process according to claim 1, wherein step (S5) is carried out at room temperature between 20°C and 25°C in the presence of 2,3,4,6,7,8,9,10-octahydropyrimido[1,2-a]azepine and carbonyldiimidazole.

[Claim 7] Process according to claim 1, wherein step (S6) is carried out at reflux.

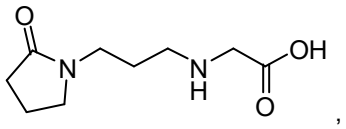
[Claim 8] Process according to claim 1, wherein the compound obtained at the end of step (S7) comprises the compound of formula FI and less than 0.3% of each individual impurity.

[Claim 9] A Compound of formula:



.

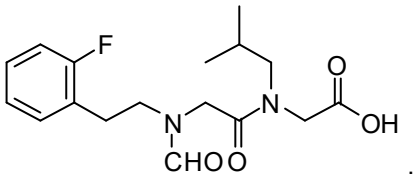
[Claim 10] A salt of a compound of formula:



,

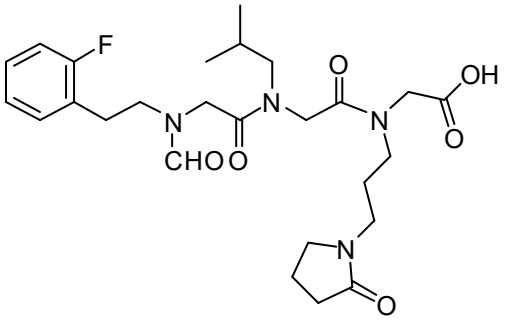
.

[Claim 11] A Compound of formula FCS4:



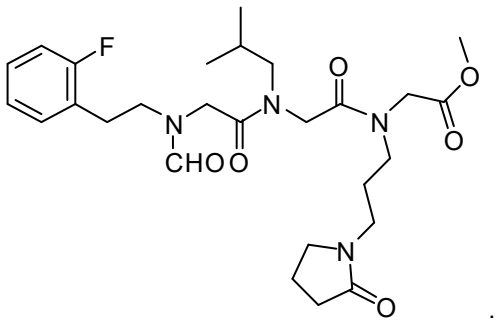
.

[Claim 12] A Compound of formula:



.

[Claim 13] A Compound of formula:



[Claim 14] A Pharmaceutical composition comprising the compound of formula FI obtained by the process according to anyone of claims 1 to 8, and optionally one or more pharmaceutically acceptable excipient(s) wherein it comprises preferably less than 0.3% of each individual impurity.