Supplementary Material

Table S1. RMSD value between EGFR and native ligand of 1IVO after molecular docking using CDOCKER, LibDock and LigandFit docking algorithm

| No. | Pose | Referenc | RMSD value (Å) | Pose | Referenc | RMSD value (Å) | Pose | Referenc | RMSD value (Å) |
|-----|------|----------|---------------|------|----------|---------------|------|----------|---------------|
| 1   | 1IVO-1 | 1IVO-1 | 0.0000 | 1IVO-1 | 1IVO-1 | 0.0000 | 1IVO-1 | 1IVO-1 | 0.0000 |
| 2   | 1IVO-2 | 1IVO-1 | 3.2411 | 1IVO-2 | 1IVO-1 | 13.4153 | 1IVO-2 | 1IVO-1 | 1.6592 |
| 3   | 1IVO-3 | 1IVO-1 | 1.9480 | 1IVO-3 | 1IVO-1 | 17.4821 | 1IVO-3 | 1IVO-1 | 7.2496 |
| 4   | 1IVO-4 | 1IVO-1 | 17.1064 | | | | | | |
| 5   | 1IVO-5 | 1IVO-1 | 7.7512 | | | | | | |
| 6   | 1IVO-6 | 1IVO-1 | 2.9591 | | | | | | |
| 7   | 1IVO-7 | 1IVO-1 | 13.3061 | | | | | | |
| 8   | 1IVO-8 | 1IVO-1 | 22.5397 | | | | | | |
| 9   | 1IVO-9 | 1IVO-1 | 21.1556 | | | | | | |
| 10  | 1IVO-10 | 1IVO-1 | 11.4168 | | | | | | |
| 11  | 1IVO-11 | 1IVO-1 | 15.5136 | | | | | | |
**Table S2.** The Box-Behnken experimental design and the response for the SCP

| Run order | Independent variable | Soluble peptides content (mg/mL) |
|-----------|----------------------|---------------------------------|
|           | Time (h)            | Temperature (°C) | E/S (U/g) | pH | Experimental | Predicted |
| 1         | 3.5                 | 45               | 6000      | 7.5 | 0.3985       | 0.3895    |
| 2         | 3.5                 | 45               | 6500      | 7.0 | 0.3083       | 0.3200    |
| 3         | 3.5                 | 50               | 6000      | 7.0 | 0.4879       | 0.4900    |
| 4         | 3.5                 | 50               | 6000      | 7.0 | 0.4898       | 0.4900    |
| 5         | 4.5                 | 50               | 6500      | 7.0 | 0.3825       | 0.3806    |
| 6         | 4.0                 | 50               | 5500      | 7.5 | 0.4351       | 0.4345    |
| 7         | 3.5                 | 50               | 6000      | 7.5 | 0.4326       | 0.4260    |
| 8         | 4.5                 | 55               | 6000      | 7.0 | 0.4531       | 0.4466    |
| 9         | 4.5                 | 50               | 6000      | 6.5 | 0.4263       | 0.4200    |
| 10        | 4.0                 | 55               | 6000      | 7.5 | 0.4569       | 0.4575    |
| 11        | 4.0                 | 45               | 5500      | 7.0 | 0.3993       | 0.3780    |
| 12        | 4.0                 | 50               | 5500      | 6.5 | 0.4737       | 0.4695    |
| 13        | 4.0                 | 45               | 6000      | 6.5 | 0.3741       | 0.3665    |
| 14        | 3.5                 | 55               | 6000      | 7.0 | 0.4931       | 0.4874    |
| 15        | 4.0                 | 55               | 6000      | 6.5 | 0.5034       | 0.5065    |
| 16        | 3.5                 | 45               | 6000      | 7.0 | 0.3622       | 0.3614    |
| 17        | 4.0                 | 50               | 6500      | 6.5 | 0.3980       | 0.3895    |
| 18        | 3.5                 | 50               | 6000      | 6.5 | 0.4725       | 0.4669    |
| 19        | 3.5                 | 50               | 5500      | 7.0 | 0.4608       | 0.4574    |
| 20        | 4.5                 | 50               | 6000      | 7.5 | 0.4455       | 0.4351    |
| 21        | 4.0                 | 50               | 6000      | 7.0 | 0.4995       | 0.4900    |
| 22        | 4.5                 | 50               | 5500      | 7.0 | 0.4163       | 0.4166    |
| 23        | 4.0                 | 55               | 6500      | 7.0 | 0.4432       | 0.4240    |
| 24        | 3.5                 | 50               | 6500      | 7.0 | 0.3815       | 0.3774    |
| 25        | 4.0                 | 50               | 6000      | 7.0 | 0.5037       | 0.4900    |
| 26        | 4.0                 | 50               | 6500      | 7.5 | 0.4037       | 0.3985    |
| 27        | 4.0                 | 50               | 6000      | 7.0 | 0.4913       | 0.4900    |
| 28        | 4.5                 | 45               | 6000      | 7.0 | 0.3677       | 0.3646    |
| 29        | 4.0                 | 55               | 5500      | 7.0 | 0.4840       | 0.4820    |
Fig. S1 Degree of hydrolysis of yak bone collagen by the six different enzymes during 5 hours
Fig. S2 Comparison the effect of six different enzymes hydrolysates on OPPA (asterisks indicate significant differences compared with control group at $P < 0.05$)
Fig. S3 The OPPA of peptides (0.1, 0.2 and 0.5 mg/mL) at different culture time (asterisks indicate significant differences compared with control group at $P<0.05$)
Fig. S4 The OPPA of the synthetic peptides (GP-16 and GD-18) (0.01, 0.02 and 0.05 mg/mL) at different culture time. (A) Synthetic peptide GP-16; (B) Synthetic peptide GD-18 (asterisks indicate significant differences compared with control group at $P<0.05$)