Supplementary material - Table 1. Chemical composition of hemp seeds, protein isolate (HPI), and the HPH60A+15F. The data is expressed as grams per 100 grams of dry weight and shows the mean ± standard deviation of three determinations.

Proximate composition (g/100 g of product)	**Seeds**	**HPI**	**HPH60A+15F**
Ash	5.0 ± 0.0	1.0 ± 0.1	10.1 ± 0.3
Proteins	23.8 ± 1.0	96.4 ± 0.9	82.3 ± 0.0
Fat	31.8 ± 0.5	0.2 ± 0.0	ND
Fibre	29.3 ± 1.4	ND	ND
Polyphenols	0.3 ± 0.0	0.0 ± 0.0	ND
Soluble sugars	5.1 ± 1.0	ND	ND

ND: not determined.

Supplementary material - Table 2. Amino acid composition of hemp protein isolate (HPI) and the HPH60A+15F. The data, expressed as milligrams of amino acids per grams of total protein, are the mean ± standard deviation of three determinations.

	HPI	**HPH60A+15F**	**2007 FAO/WHO/UNU [a,b]**
Histidine	28.6 ± 0.2	27.7 ± 0.1	15
Isoleucine	23.8 ± 0.0	39.2 ± 0.7	30
Leucine	62.9 ± 0.4	64.6 ± 0.9	59
Lysine	29.2 ± 0.2	33.4 ± 0.4	45
Methionine + Cysteine	29.6 ± 6.6	25.0 ± 0.7	22
Methionine	17.9 ± 6.2	18.5 ± 0.4	16
Cysteine	11.7 ± 0.3	6.6 ± 0.3	6
Phenylalanine + Tyrosine	78.7 ± 0.7	80.3 ± 1.2	38
Threonine	34.1 ± 0.4	34.4 ± 0.5	23
Tryptophan	11.9 ± 0.2	11.1 ± 0.5	6
Valine	34.8 ± 1.1	42.6 ± 1.0	39
Total essential amino acids	363.2	383.3	277
Aspartic acid	151.7 ± 0.8	146.1 ± 1.7	
Glutamic acid	194.2 ± 1.7	189.8 ± 3.6	
Serine	59.6 ± 0.4	54.1 ± 0.8	
Glycine	40.1 ± 0.2	36.9 ± 1.0	
Arginine	126.5 ± 0.9	131.6 ± 1.6	
Alanine	47.6 ± 0.4	44.7 ± 1.0	
Proline	58.6 ± 10.7	28.8 ± 0.4	
Total non-essential amino acids	678.2	632.1	

[a] FAO/WHO/UNU. Protein requirement mg/g score pattern in adults. [b] FAO and FINUT 2017. Evaluation of the quality of dietary protein in human nutrition. FAO Food and Nutrition Document NO. 92.

Supplementary material – Table 3. Sequences of the designed oligonucleotides

Gene	Accession Number	Sequence
GAPDH	NM_001411845.1	ATGGCGTTGTGAGGTGCATA
		ACTGTGCCGTTGAATTTGCC
TNF-α	NM_013693.3	CACAGAAAGCATGATCCGCG
		ACTGATGAGAGGGAGGCCAT
IL-1β	NM_008361.4	GTCGCTCAGGGTCACAAGAA
		CCACACGTTGACAGCTAGGT
IL-6	NM_031168.2	ACTGGGGATGTCTGTAGCTCA
		CTGTGAAGTCTCCTCTCCGG
IL-10	NM_010548.2	CCTGGTAGAAGTGATGCCCC
		GCTCCACTGCCTTGCTCTTA
iNOS	NM_010927.4	CTGCAGCACTTGGATCAGGA
		GCCAGAAACTTCGGAAGGGA

Supplementary material – Table 4. Characterization of the peptide sequence identified in the neuroHPH60A+15F based on *in silico* analyses.

PEPTIDE	PREAIP [1]	PEPTIDE RANKER (THRESHOLD 0.5) [2]	PRETP-STACK - ANTI-INFLAMMATORY (THRESHOLD 0.5) [3]	ANOXPRED (FRS) [4]	ANOXPRED (CHEL) [4]	SCMB3PP (THRESHOLD 749) [5]	HYDROPHOBICITY [6]	STERIC HINDRANCE [6]	WATER SOLUBILITY [6]	PI [6]	CHARGE [6]	AMPHIPATHICITY [6]	SELF-AGGREGATION-PRONE REGION & AMYLOIDS [7]	DISORDER PROBABILITY (%) [7]	A-HELIX [7]	B-STRAND [7]	COIL [7]
EDTEEHHLR	0.323	0.094357	0.473	0.48542848	0.26215655	725.5	-0,53	0,5	Good	4,81	-2	1,02	4 - 7 (NI)	100	33.33	-	66.67
LPHPAPNFK	0.504	0.83981	0.589	0.53182054	0.31723848	808.5	-0,11	0,47	Poor	9,11	1,5	0,57	5 - 8 (NI)	100	-	-	100
STTTGHLLYK	0.404	0.128232	0.482	0.47871155	0.24595422	778.89	-0,11	0,52	Poor	8,94	1,5	0,51	6 - 9 (NI)	100	-	10.00	90.00
YYKVVLDVK	0.373	0.0828702	0.512	0.31042	0.14705	705.75	-0,08	0,68	Good	8,76	1	0,82	4 - 8 (PA)	100	-	55.56	44.44
YVNGPKLLY	0.429	0.359528	0.575	0.46280036	0.20888114	725.38	0	0,63	Poor	8,83	1	0,41	6 - 9 (NI)	100	-	-	100
LGAQVYHNLK	0.435	0.36153	0.583	0.56095952	0.21302354	766.11	-0,08	0,58	Poor	8,94	1,5	0,64	5 - 9 (NI)	100	40.00	-	60.00
ESYSLYVYK	0.428	0.246647	0.522	0.49872723	0.192700	796.25	-0,12	0,64	Poor	6,34	0	0,55	5 - 8 (NI)	100	-	55.56	44.44
MVNHFLAEFK	0.402	0.38354	0.556	0.45329586	0.2500 27	718.78	0	0,61	Poor	7,1	0,5	0,64	1 - 6 (NI)	100	60.00	-	40.00
ESYSVYVKY	0.417	0.193184	0.596	0.45912769	0.176500	788.25	-0,12	0,66	Poor	6,34	0	0,55	3 - 9 (NI)	100	-	55.56	44.44
EHALLAYTLRK	0.511	0.353369	0.59	0.40344498	0.2267179	747.8	-0,18	0,54	Good	8,94	1,5	0,8	4 - 9 (NI)	100	54.55	-	45.45
YSNSPKLLY	0.396	0.439579	0.567	0.38785547	0.22962452	750.88	-0,14	0,59	Poor	8,83	1	0,41	6 - 9 (NI)	100	-	-	100
AAAQLGSVTESLQACK	0.588	0.398503	0.579	0.35740	0.17118	766.27	-0,06	0,59	Poor	6,32	0	0,46	8 - 12 (NI)	100	81.25	-	18.75
AAEDDEDDNVDKT	0.365	0.0962144	0.437	0.33948	0.22220206	740.83	-0,44	0,68	Good	3,58	-6	0,48	10 - 13 (NI)	100	-	-	100
HTLNQLDSVK	0.433	0.0625703	0.46	0.32810	0.20691	767.33	-0,24	0,57	Good	7,09	0,5	0,64	1 - 4 (NI)	100	40.00	-	60.00
VPTANVSVVEVTRC	0.536	0.147527	0.567	0.35154	0.15323	735.46	-0,05	0,62	Poor	6,32	0	0,27	6 - 9 (PA)	100	-	50.00	50.00
LNNPSNSDLFNPR	0.403	0.563255	0.474	0.35878	0.21900536	783.33	-0,31	0,62	Good	6,19	0	0,19	8 - 11 (NI)	100	-	-	100

FEDENFLLK	0.453	0.564802	0.639	0.39690238	0.24505743	775.5	-0,16	0,67	Good	4,14	-2	0,69	5 - 8 (NI)	100	-	-	100
EAESCNCLQGFQLTH	0.404	0.519936	0.514	0.41027448	0.24399231	773.21	-0,13	0,58	Poor	4,51	-1,5	0,43	5 - 8 (NI)	100	-	-	100
VNRTWLPL	0.401	0.623818	0.564	0.47552571	0.19575	724.71	-0,08	0,57	Poor	10,11	1	0,31	1 - 6 (NI)	100	-	-	100
LLSSVYDNEFGYSRN	0.316	0.281731	0.426	0.45479041	0.172230	745.5	-0,18	0,65	Good	4,38	-1	0,25	1 - 6 (NI)	100	-	-	100
LLSWYNNEFGYSGGR	0.324	0.552753	0.517	0.44323766	0.170556	790.43	-0,11	0,64	Poor	6,35	0	0,25	1 - 5 (NI)	100	6.67	-	93.33
FEQLCSDRLF	0.573	0.749277	0.56	0.35562	0.2269246	770.89	-0,17	0,64	Good	4,38	-1	0,5	1 - 5 (NI)	100	40.00	-	60.00
NAKGSFVKLL	0.428	0.507923	0.52	0.31827	0.20003	718.33	-0,05	0,63	Good	10,02	2	0,73	6 - 10 (NI)	100	-	30.00	70.00
MKLAGSNPQQQQSF	0.420	0.218761	0.451	0.45335084	0.30286241	764.85	-0,23	0,63	Poor	9,11	1	0,62	11 - 14 (NI)	100	28.57	-	71.43
AAEDDEDDDVDKT	0.371	0.0854395	0.444	0.32002	0.20780484	756.67	-0,45	0,68	Good	3,51	-7	0,48	10 - 13 (NI)	100	-	-	100
EKGVLLVGPN	0.420	0.227924	0.568	0.34339	0.19422	758.0	0	0,63	Good	6,35	0	0,49	4 - 7 (PA)	100	-	40.00	60.00
LLSNASCTTNCLAPLAK	0.617	0.361523	0.572	0.32969	0.21335886	785.06	-0,02	0,56	Poor	8,38	1	0,22	7 - 11 (NI)	100	17.65	-	82.35
NGPENQFRQQ	0.492	0.223412	0.508	0.40868723	0.26078859	792.78	-0,5	0,67	Good	6,36	0	0,75	6 - 9 (NI)	100	30.00	-	70.00
VNRLTEGPLL	0.464	0.220706	0.595	0.44578308	0.24361433	735.11	-0,1	0,6	Good	6,36	0	0,37	1 - 5 (NI)	100	-	-	100
LRPHWNLN	0.501	0.610303	0.563	0.52289259	0.28062597	785.86	-0,26	0,52	Poor	10,11	1,5	0,49	5 - 8 (NI)	100	-	-	100
LGMFDLHYCDK	0.522	0.57749	0.528	0.5376063	0.23542656	782.2	-0,07	0,61	Good	5,22	-0,5	0,47	3 - 9 (NI)	100	-	-	100
NNNFGPGPGSNFR	0.456	0.645374	0.542	0.50951195	0.24683063	797.58	-0,23	0,65	Poor	10,11	1	0,19	1 - 4 (NI)	100	-	-	100
ELKRLVGPN	0.464	0.141099	0.617	0.31579	0.17415	766.5	-0,27	0,62	Good	9,1	1	0,82	2 - 6 (NI)	100	11.11	-	88.89
QNGQFSVLFTK	0.412	0.547261	0.503	0.29890	0.19180	716.2	-0,1	0,65	Poor	9,11	1	0,56	5 - 10 (NI)	100	-	45.45	54.55
NLNNPSDSDLFNPR	0.377	0.486181	0.509	0.33186	0.20590182	783.92	-0,34	0,63	Good	4,21	-1	0,18	1 - 4 (NI)	100	-	-	100
GNPEDEFRGAQ	0.341	0.397282	0.526	0.36560	0.21666835	780.1	-0,36	0,65	Good	4,14	-2	0,57	6 - 9 (NI)	100	36.36	-	63.64
LVDTFLEDKV	0.404	0.116838	0.561	0.32919	0.22525312	795.89	-0,06	0,66	Good	4,03	-2	0,49	1 - 6 (NI)	100	50.00	-	50.00

ALQPDNRLQ	0.389	0.319923	0.593	0.40005091	0.26825362	759.62	-0,36	0,61	Good	6,19	0	0,55	6 - 9 (NI)	100	-	-	100
SYELPDGKVLTLGNNGN	0.505	0.465178	0.518	0.28163	0.28163	778.94	-0,13	0,64	Good	4,38	-1	0,29	9 - 12 (NI)	100	-	23.53	76.47
DPVQEAWAENVDLVG	0.331	0.296177	0.463	0.41713649	0.22252923	769.0	-0,06	0,64	Good	3,44	-4	0,25	11 - 14 (NI)	100	73.33	-	26.67
TVTAMNVVYALK	0.449	0.0810588	0.566	0.38571241	0.19427	701.82	0,07	0,64	Poor	8,94	1	0,31	1 - 11 (PA)	66.66	58.33	-	41.67
YSNSKPLLY	0.397	0.471727	0.57	0.38281673	0.20830171	772.12	-0,14	0,59	Poor	8,83	1	0,41	6 - 9 (NI)	100	-	-	100
LEVLELSSTDL	0.535	0.0788546	0.497	0.28422	0.23605816	738.8	0	0,59	Good	3,58	-3	0,23	1 - 4 (NI)	100	-	36.36	63.64
VLTAVNEEALSTRA	0.498	0.0989727	0.597	0.38062662	0.173178	760.62	-0,1	0,6	Good	4,54	-1	0,3	1 - 5 (NI)	100	35.71	-	64.29
SLTAMNVVYALK	0.512	0.213545	0.608	0.36665452	0.187179	703.73	0,06	0,62	Poor	8,94	1	0,31	2 - 11 (PA)	100	58.33	-	41.67
QELSNLDDAVR	0.440	0.131161	0.511	0.28921	0.21897164	804.0	-0,32	0,65	Good	4,03	-2	0,45	3 - 6 (NI)	100	54.55	-	45.45
ESTLHLVLR	0.452	0.234661	0.601	0.4112438	0.247698 32	784.38	-0,12	0,52	Good	7,1	0,5	0,57	3 - 8 (NI)	100	-	55.56	44.44
NDYFSNFSGVYSQLDK	0.443	0.263269	0.454	0.43239525	0.22986418	788.4	-0,17	0,67	Poor	4,21	-1	0,31	3 - 11 (NI)	100	56.25	-	43.75
VVDENGNSVFDSGGVV	0.432	0.208917	0.447	0.28548	0.156061	793.07	0	0,69	Good	3,5	-3	0,08	7 - 10 (NI)	100	-	-	100
DAVTYTEHAK	0.467	0.0723056	0.701	0.48503625	0.19299	789.11	-0,21	0,56	Good	5,33	-0,5	0,64	3 - 6 (NI)	100	-	-	100
SLGGGTGSGMASLLLSK	0.682	0.687913	0.618	0.41029149	0.21445607	779.5	0,07	0,6	Poor	9,11	1	0,22	13 - 16 (NI)	100	52.94	-	47.06
VVTGVANLAAHR	0.425	0.113075	0.483	0.38288996	0.20633644	772.0	0,01	0,57	Poor	10,11	1,5	0,33	1 - 8 (NI)	100	50.00	-	50.00
ASALDSPPVLKT	0.403	0.359592	0.608	0.45643193	0.25210443	756.09	-0,05	0,55	Good	6,19	0	0,31	9 - 12 (NI)	100	-	-	100
LAQANGWGVMVSHR	0.523	0.480854	0.498	0.51482069	0.14972	779.77	-0,05	0,59	Poor	10,11	1,5	0,37	7 - 11 (NI)	100	-	35.71	64.29
ETVHKNLNSS	0.358	0.0461699	0.443	0.32179	0.22774638	703.78	-0,3	0,57	Good	7,1	0,5	0,64	1 - 5 (NI)	100	30.00	-	70.00
ELTALAPSTMK	0.489	0.239017	0.521	0.32886	0.23852357	772.1	-0,05	0,56	Good	6,35	0	0,45	2 - 5 (NI)	100	-	-	100
LHPFAAHLL	0.546	0.728657	0.584	0.4774946	0.29610017	793.75	0,2	0,41	Poor	7,26	1	0,32	4 - 9 (NI)	100	55.56	-	44.44
LWYGFQNALLAAL	0.606	0.606177	0.5	0.40568617	0.21089363	753.75	0,21	0,59	Poor	5,88	0	0,1	1 - 5 (NI)	100	76.92	-	23.08
YASSANLHLPK	0.431	0.400494	0.473	0.40242538	0.23710489	736.3	-0,1	0,51	Poor	8,94	1,5	0,47	6 - 9 (NI)	100	-	-	100

AGVLQSYAVAEKV	0.392	0.125511	0.552	0.43533882	0.16851	800.42	0,03	0,63	Poor	6,35	0	0,48	3 - 9 (NI)	100	69.23	-	30.77
SYSPYDMLEVEK	0.422	0.16464	0.541	0.43216446	0.18660	750.55	-0,19	0,64	Good	4,14	-2	0,52	7 - 10 (NI)	100	33.33	-	66.67
FNADQFQVMVAAAD	0.476	0.215165	0.47	0.35400	0.20241	778.54	0,01	0,66	Poor	3,57	-2	0,18	8 - 11 (NI)	100	71.43	-	28.57
VSFELFAGSV	0.494	0.329438	0.593	0.40308008	0.24374738	805.0	0,21	0,63	Poor	4	-1	0,13	1 - 5 (NI)	100	-	40.00	60.00
SLGGGTGSGMGTLLLSK	0.624	0.509696	0.672	0.45042118	0.20130	792.25	0,06	0,61	Poor	9,11	1	0,22	12 - 15 (NI)	100	35.29	-	64.71
VFVPLDLNV	0.388	0.279804	0.463	0.40500674	0.22943987	760.88	0,21	0,64	Poor	3,8	-1	0	1 - 9 (NI)	100	-	-	100
LSELEAALGNL	0.483	0.266984	0.558	0.34489	0.25416312	760.7	0,06	0,59	Good	3,8	-2	0,23	8 - 11 (NI)	100	54.55	-	45.45
QHALLAYTLGVK	0.495	0.328109	0.554	0.43817875	0.18969	744.73	0,04	0,55	Poor	8,94	1,5	0,53	4 - 11 (NI)	50.00	33.33	8.33	58.33
KTPHVNVGTLGHVDHKG	0.512	0.124409	0.494	0.42849854	0.21624123	715.0	-0,15	0,53	Good	8,94	2,5	0,69	5 - 13 (NI)	100	-	-	100
YLSPDQLADLKY	0.428	0.233407	0.492	0.34920	0.23738429	740.45	-0,14	0,61	Good	4,21	-1	0,41	7 - 10 (NI)	100	50.00	-	50.00
EPLELPEDEEKE	0.511	0.0875933	0.46	0.43165615	0.24520122	799.64	-0,39	0,61	Good	3,77	-6	0,94	9 - 12 (NI)	100	-	-	100
YFAPHQHQH	0.353	0.296796	0.485	0.56611812	0.31276613	835.25	-0,2	0,4	Poor	7,35	1,5	0,76	5 - 9 (NI)	100	-	-	100
LVQAFAGFTDK	0.420	0.315678	0.592	0.37607	0.21471	849.0	0,02	0,64	Poor	6,19	0	0,45	1 - 5 (NI)	100	36.36	-	63.64
LEVLELMDTR	0.548	0.110758	0.548	0.33295	0.21475784	775.22	-0,15	0,64	Good	4,14	-2	0,5	3 - 7 (NI)	100	50.00	-	50.00
LPFPLLDDGV	0.408	0.582772	0.464	0.37851363	0.23965934	783.0	0,13	0,59	Poor	3,57	-2	0	5 - 10 (NI)	100	-	-	100
PMCVESFSDYPPLGR	0.435	0.581146	0.503	0.40742454	0.22518964	753.93	-0,11	0,6	Good	4,38	-1	0,25	3 - 8 (NI)	100	-	-	100
SYELPNGQVLTLLNDN	0.547	0.281871	0.467	0.34747	0.17329	778.33	-0,1	0,63	Poor	3,67	-2	0,16	9 - 13 (NI)	100	-	31.25	68.75
YASSARAHLKP	0.481	0.338073	0.558	0.42281002	0.21914421	696.9	-0,23	0,51	Good	10,01	2,5	0,69	6 - 9 (NI)	100	36.36	-	63.64
DATNVGNQGGFAPNLLFSH	0.454	0.511472	0.492	0.43755394	0.26658848	808.17	-0,02	0,6	Poor	5,09	-0,5	0,14	14 - 17 (NI)	100	-	-	100
WVTYTEHAK	0.498	0.0864708	0.624	0.52398872	0.18039	781.75	-0,14	0,54	Poor	7,1	0,5	0,71	1 - 5 (NI)	100	-	-	100
LTTLEVQPHEVELHAA	0.532	0.0560362	0.449	0.46016908	0.2628195	747.07	-0,04	0,51	Good	4,73	-2	0,5	1 - 4 (NI)	100	-	37.50	62.5
MKLGNKHLPQL	0.456	0.258417	0.46	0.46672148	0.24246329	742.6	-0,18	0,56	Good	10,02	2,5	0,91	5 - 8 (NI)	100	-	-	100

LYAPQVLRGNT	0.470	0.27195	0.57	0.34823	0.17648	820.0	-0,12	0,61	Poor	9,1	1	0,34	5 - 8 (NI)	100	-	-	100
LDEDVLLVFPV	0.425	0.364639	0.517	0.24642	0.24642254	786.7	0,15	0,63	Good	3,5	-3	0,12	5 - 9 (PA)	100	-	45.45	54.55
MKLGNQHVLPK	0.442	0.201473	0.494	0.49182674	0.22912064	729.2	-0,18	0,58	Good	10,02	2,5	0,91	6 - 9 (NI)	100	-	-	100
SEDFGVNENLADSDAVG	0.444	0.195115	0.481	0.39852968	0.19967	775.0	-0,13	0,66	Good	3,34	-5	0,45	4 - 7 (NI)	100	-	-	100
VVDLMAHMASK	0.538	0.188979	0.561	0.4488796	0.24506909	769.6	0,01	0,59	Poor	7,09	0,5	0,47	1 - 5 (NI)	100	72.73	-	27.27
DNLQGLTKLPAR	0.441	0.274568	0.481	0.34309	0.21724695	699.0	-0,26	0,6	Good	9,1	1	0,61	6 - 9 (NI)	100	-	-	100
AAVEEGVVAGGRALVAV	0.474	0.215247	0.502	0.37971625	0.17427	745.5	0,12	0,63	Poor	4,54	-1	0,29	14 - 17 (NI)	82.35	-	35.29	64.71
ANKGSFVKLL	0.473	0.515945	0.554	0.33193	0.19329	725.0	-0,05	0,63	Good	10,02	2	0,73	6 - 10 (NI)	100	10.00	20.00	70.00
YEELQSLQK	0.511	0.0589363	0.586	0.35677	0.26017243	787.5	-0,32	0,63	Good	4,54	-1	0,97	4 - 7 (NI)	100	66.67	-	33.33
FESEVYLLSK	0.470	0.225631	0.589	0.43256617	0.19991	765.78	-0,06	0,63	Good	4,54	-1	0,62	5 - 8 (NI)	100	-	40.00	60.00
HQGVMVGMGQK	0.506	0.221249	0.513	0.40631881	0.20567694	806.9	-0,07	0,64	Poor	9,11	1,5	0,69	4 - 8 (NI)	100	-	27.27	72.73
DSYVGNEALVM	0.466	0.26744	0.629	0.38773027	0.22883895	771.8	0,01	0,67	Poor	3,67	-2	0,12	8 - 11 (NI)	100	-	-	100
RVTVHGANGLQLPTF	0.347	0.216065	0.403	0.54460669	0.25560895	790.0	-0,04	0,57	Poor	10,11	1,5	0,34	2 - 5 (NI)	100	-	13.33	86.67
LETLEVNSGCL	0.523	0.163622	0.538	0.30438563	0.22249383	740.5	0	0,62	Good	3,8	-2	0,23	6 - 11 (NI)	100	-	18.18	81.82
VLLAAHGNSLR	0.477	0.251137	0.532	0.47760406	0.24775901	751.1	-0,02	0,54	Poor	10,11	1,5	0,35	1 - 4 (NI)	100	-	18.18	81.82
FEELGGADLGFV	0.427	0.488262	0.469	0.40464604	0.20721523	796.36	0,13	0,65	Good	3,58	-3	0,21	9 - 12 (NI)	100	-	-	100
LAQANGWLNSASRH	0.494	0.427648	0.452	0.39793226	0.19821	768.23	-0,17	0,55	Poor	10,11	1,5	0,37	7 - 10 (NI)	100	42.86	-	57.14
DVKESNAKTEPAL	0.425	0.125147	0.534	0.31541	0.23473744	778.08	-0,29	0,61	Good	4,68	-1	0,76	2 - 5 (NI)	100	-	-	100
VFLQNVLGV	0.385	0.240594	0.504	0.37942806	0.19975	768.88	0,24	0,66	Poor	5,88	0	0,14	1 - 9 (PA)	100	44.44	-	55.56
MLKGKKVSW	0.458	0.196316	0.475	0.28676	0.16493	682.38	-0,19	0,64	Good	10,31	3	1,22	5 - 9 (NI)	100	-	-	100

LLNEPTAAALGNFMLL	0.568	0.766049	0.554	0.31920	0.2433082	757.33	0,14	0,59	Poor	4	-1	0,08	13 - 16 (NI)	100	62.5	-	37.5
LLDSVGLEMTGGPE	0.483	0.150938	0.501	0.40793148	0.21636893	801.69	0,03	0,62	Good	3,58	-3	0,18	1 - 5 (NI)	100	-	-	100
NPDDLTQQQYSVFFSG	0.497	0.256997	0.454	0.45808849	0.20450	783.53	-0,15	0,64	Poor	3,57	-2	0,23	10 - 14 (NI)	100	56.25	6.25	37.50
ADLLGGNLSLAAK	0.588	0.384925	0.524	0.37299588	0.21430607	762.25	0,04	0,6	Poor	6,19	0	0,28	7 - 10 (NI)	100	15.38	-	84.62
DSTLLMQLGLV	0.598	0.352087	0.566	0.33284	0.2768037	768.2	0,11	0,62	Poor	3,8	-1	0,11	3 - 11 (NI)	100	54.55	-	45.45
WVFVPAGGKQL	0.515	0.552931	0.545	0.49929824	0.26103133	784.6	0,12	0,61	Poor	9,11	1	0,45	1 - 4 (PA)	100	-	9.09	90.91
VDFLPAAGAFLP	0.448	0.829948	0.51	0.46681398	0.27830237	807.55	0,24	0,57	Poor	3,8	-1	0	1 - 4 (NI)	100	-	-	100
LLPAYSNSPKLLY	0.441	0.432078	0.575	0.45682043	0.23541372	745.25	0	0,56	Poor	8,83	1	0,28	10 - 13 (NI)	100	-	-	100
FLANVSTVLGMK	0.436	0.502157	0.585	0.34032	0.18326	763.18	0,1	0,64	Poor	9,11	1	0,31	1 - 9 (PA)	100	50.00	-	50.00
LGSGVLLVGNP	0.455	0.377937	0.58	0.39925662	0.19872	773.7	0,2	0,61	Poor	5,88	0	0	5 - 8 (PA)	100	-	36.36	63.64
VFLQNVVAV	0.350	0.105802	0.444	0.36585	0.19930	771.25	0,25	0,67	Poor	5,88	0	0,14	1 - 9 (PA)	100	-	22.22	77.78
LDTLELLTVGD	0.571	0.0772192	0.507	0.33621	0.24147359	767.9	0,04	0,61	Good	3,5	-3	0,12	6 - 9 (NI)	100	-	45.45	54.55
LVSWYNGGETGYSNK	0.363	0.164485	0.511	0.49813297	0.15151	803.93	-0,12	0,64	Poor	6,35	0	0,33	1 - 5 (NI)	100	-	-	100
YKPLDLRKP	0.460	0.433393	0.511	0.32926	0.22521567	788.75	-0,42	0,59	Good	9,72	2	1,09	4 - 7 (NI)	100	-	-	100
EAMEDGELDDAL	0.362	0.0993575	0.414	0.35338	0.22205411	714.0	-0,17	0,66	Good	3,3	-6	0,32	8 - 12 (NI)	100	-	-	100
WLYNNGRTPLVL	0.579	0.425919	0.628	0.43596399	0.18148	799.82	-0,05	0,61	Poor	9,1	1	0,2	1 - 4 (NI)	100	-	-	100
LVSPHAPACVTF	0.495	0.593501	0.546	0.51543415	0.25703362	800.82	0,15	0,51	Poor	7,06	0,5	0,12	9 - 12 (NI)	100	-	-	100
LNFSHASHEYHAETKL	0.447	0.180224	0.469	0.58104032	0.23319894	718.93	-0,17	0,49	Good	6,3	0,5	0,66	5 - 11 (NI)	100	31.25	-	68.75
GLFPSLVGRPR	0.499	0.794303	0.565	0.38742959	0.22788262	794.6	-0,13	0,58	Good	12,01	2	0,45	5 - 8 (NI)	100	-	-	100
LAVNMVAQANL	0.471	0.143183	0.515	0.33578	0.20443	747.0	0,11	0,64	Poor	5,88	0	0,11	1 - 6 (NI)	100	54.55	-	45.45
YVDGPKLLY	0.415	0.372362	0.562	0.45121285	0.22133128	759.38	-0,01	0,63	Poor	6,18	0	0,41	6 - 9 (NI)	100	-	-	100
VFVPEVPKT	0.453	0.186681	0.515	0.43407851	0.21357945	799.0	0,02	0,6	Good	6,35	0	0,55	1 - 4 (NI)	100	-	-	100

FVTSWTGGQASQV	0.498	0.104821	0.5	0.48351473	0.23533818	793.0	0,03	0,61	Poor	5,88	0	0,19	1 - 6 (NI)	100	-	-	100
SSGPYGGGHTQEAK	0.362	0.304952	0.461	0.57880718	0.21660797	764.85	-0,19	0,57	Good	7,1	0,5	0,55	9 - 12 (NI)	100	-	-	100
SSFYVNGLTLGGQK	0.421	0.313953	0.453	0.40274075	0.18927	730.69	-0,03	0,64	Poor	8,94	1	0,35	3 - 10 (NI)	100	-	21.43	78.57
FPGQLANDRL	0.366	0.690445	0.448	0.36547	0.2440286	769.0	-0,18	0,62	Good	6,19	0	0,37	4 - 7 (NI)	100	-	-	100
LLSWYNNEFGGHAPGT	0.444	0.392721	0.476	0.49705651	0.2119088	821.67	0	0,57	Poor	5,25	-0,5	0,17	1 - 5 (NI)	100	6.25	-	93.75
EHALLAYTVAVK	0.503	0.295266	0.575	0.44669354	0.18242	756.55	0,05	0,55	Poor	7,1	0,5	0,53	4 - 11 (PA)	50.00	-	58.33	41.67
YLSPDKLADMTR	0.472	0.347789	0.585	0.28316	0.19704	755.45	-0,27	0,61	Good	6,31	0	0,51	9 - 12 (NI)	100	58.33	-	41.67
EEASNYLENKATR	0.518	0.111459	0.561	0.43440059	0.17673	766.17	-0,41	0,63	Good	4,79	-1	0,76	4 - 7 (NI)	100	69.23	-	30.77
VLGSGCNLDSAR	0.403	0.326825	0.49	0.36087	0.19466	756.73	-0,12	0,63	Good	6,16	0	0,2	1 - 4 (NI)	100	-	-	100
HLQYELLLK	0.527	0.309696	0.619	0.47464412	0.20796	725.25	-0,07	0,54	Poor	7,1	0,5	0,85	5 - 9 (NI)	100	11.11	33.33	55.56
LAEGSFVKLL	0.475	0.516527	0.578	0.37463	0.2187428	708.33	0,12	0,61	Poor	6,35	0	0,49	6 - 10 (NI)	100	10.00	20.00	70.00
LSAKAGCVPAYPL	0.401	0.539657	0.515	0.39695	0.20749	797.92	0,08	0,56	Poor	8,54	1	0,28	5 - 8 (NI)	100	-	-	100
FDVFGLEFGYDDL	0.503	0.511375	0.449	0.49063924	0.24111372	789.0	0,08	0,68	Good	3,38	-4	0,1	3 - 6 (NI)	100	-	38.46	61.54
YYVTLLDAHGPR	0.412	0.229052	0.589	0.44062093	0.21875469	712.45	-0,09	0,56	Poor	7,09	0,5	0,33	1 - 6 (NI)	100	-	33.33	66.67
EHALLAYTGLVK	0.483	0.295266	0.575	0.47886872	0.18936	759.91	0,04	0,55	Poor	7,1	0,5	0,53	4 - 11 (NI)	91.66	41.67	-	58.33
LTLPVDFVSNTL	0.447	0.197915	0.527	0.30114	0.21540612	787.09	0,1	0,6	Poor	3,8	-1	0	5 - 12 (NI)	100	-	-	100
YASSANLHLPQ	0.427	0.307092	0.463	0.42171109	0.25393876	737.4	-0,07	0,51	Poor	7,09	0,5	0,25	6 - 9 (NI)	100	-	-	100
LDADELALVNVLEVGS	0.595	0.189191	0.451	0.31691	0.22381406	738.93	0,05	0,63	Good	3,44	-4	0,16	6 - 12 (PA)	100	68.75	-	31.25
VNQVGWVNAL	0.528	0.279905	0.516	0.44341302	0.194000	712.0	0,1	0,65	Poor	5,88	0	0,12	1 -10 (NI)	100	-	20.00	80.00
LGDLYEEEMR	0.355	0.245589	0.424	0.47127339	0.19226	743.67	-0,28	0,67	Good	4,01	-3	0,63	1 - 5 (NI)	100	50.00	-	50.00
KTSKFTGGNTL	0.403	0.196156	0.5	0.32791	0.21750008	784.0	-0,2	0,62	Good	10,02	2	0,67	2 - 6 (NI)	100	-	-	100
LAEPDNRLQ	0.360	0.275858	0.566	0.41006991	0.27901989	730.38	-0,35	0,61	Good	4,38	-1	0,55	6 - 9 (NI)	100	-	-	100

LVNQLHTPQL	0.441	0.167144	0.494	0.49607328	0.27273604	735.0	-0,05	0,53	Poor	7,1	0,5	0,4	1 - 5 (NI)	100	-	-	100
LDLDSPPLEAK	0.506	0.28009	0.587	0.40758124	0.30911446	765.2	-0,16	0,57	Good	4,03	-2	0,45	1 - 4 (NI)	100	-	-	100
AFDQLNNAPEEK	0.459	0.180533	0.521	0.41055897	0.26638427	820.0	-0,29	0,64	Good	4,14	-2	0,62	5 - 8 (NI)	100	16.67	-	83.33
VPHFNSKATF	0.485	0.507392	0.552	0.36195	0.25150704	776.22	-0,06	0,55	Poor	9,11	1,5	0,51	3 - 6 (NI)	100	-	-	100
KNEQLVQPLLSK	0.542	0.17638	0.554	0.35088	0.23181403	780.82	-0,25	0,61	Good	8,94	1	0,93	9 - 12 (NI)	100	66.67	-	33.33
VVDENGNSVFNGATVA	0.434	0.138989	0.522	0.34894	0.16940	792.2	-0,01	0,67	Poor	3,67	-2	0,08	9 - 15 (NI)	100	-	-	100
VDSLLEAAKDV	0.519	0.0768952	0.523	0.32842	0.27894446	758.4	-0,07	0,63	Good	4,03	-2	0,45	1 - 5 (NI)	100	72.73	-	27.27
VFLGNLGLSAVKV	0.530	0.256565	0.434	0.39205024	0.20204	801.67	0,18	0,63	Poor	9,11	1	0,28	1 - 13 (NI)	100	-	-	100
GNPQNAAKQSQ	0.369	0.111204	0.504	0.35178891	0.25919238	765.0	-0,37	0,62	Good	9,11	1	0,67	8 - 11 (NI)	100	63.64	-	36.36
PMFLVNTNVRP	0.486	0.278401	0.605	0.39951459	0.23847045	757.9	-0,08	0,62	Poor	10,11	1	0,22	2 - 9 (PA)	100	-	27.27	72.73
ADVFVPEVKTP	0.415	0.252916	0.491	0.4652952	0.23260595	798.6	-0,03	0,61	Good	4,38	-1	0,45	7 - 10 (NI)	100	-	-	100
VNRAMTLPLL	0.584	0.46569	0.642	0.37301007	0.22240958	648.67	0	0,59	Poor	10,11	1	0,25	1 - 7 (NI)	100	-	-	100
YALYNTFSQMV	0.408	0.36646	0.513	0.4044781	0.19215	809.1	0,04	0,65	Poor	5,87	0	0,11	3 -11 (NI)	100	63.64	-	36.36
LNNPSDSDLFAAPQ	0.388	0.32322	0.529	0.30304	0.26293203	808.31	-0,14	0,59	Good	3,57	-2	0,09	9 - 12 (NI)	100	-	-	100
VLAGLKQELTNL	0.512	0.189908	0.54	0.34758	0.18795	768.0	-0,01	0,61	Poor	6,35	0	0,52	1 - 5 (NI)	100	75.00	-	25.00
SGGGGGGGLGNSRLS	0.336	0.752894	0.425	0.48307428	0.19733327	812.79	-0,06	0,64	Good	10,11	1	0,16	11 - 14 (NI)	100	-	-	100
ANKGFSVKLL	0.472	0.534877	0.571	0.31892	0.19510	754.33	-0,05	0,63	Good	10,02	2	0,73	5 - 10 (NI)	100	-	30.00	70.00
VCENLPLVLPYAGA	0.444	0.501232	0.548	0.35925651	0.21547621	824.23	0,14	0,58	Poor	4	-1	0,09	1 - 5 (NI)	100	-	-	100
MLGKPDLKLAPL	0.534	0.596945	0.534	0.33070	0.22572958	761.0	-0,02	0,58	Good	8,94	1	0,61	7 - 10 (NI)	100	-	-	100
LNVYYNMPGLE	0.493	0.403534	0.568	0.58551896	0.17406	727.9	0,01	0,65	Poor	4	-1	0,12	1 - 7 (NI)	100	-	27.27	72.73
LEGLTNELNFGVL	0.480	0.405265	0.528	0.32924	0.22443792	790.58	0,07	0,64	Poor	3,8	-2	0,2	8 - 13 (NI)	100	-	-	100

DVKESDASPTQ	0.405	0.0670719	0.556	0.29811	0.22058594	813.3	-0,35	0,61	Good	4,03	-2	0,56	2 - 5 (NI)	100	-	-	100
STGGAPTMKTTTKV	0.375	0.145128	0.456	0.31528	0.20608586	755.69	-0,15	0,59	Good	10,02	2	0,52	8 - 14 (NI)	100	-	-	100
DSLLQDGEFSSVSNQ	0.314	0.171443	0.441	0.33928	0.20724934	733.21	-0,18	0,64	Good	3,5	-3	0,25	9 - 12 (NI)	100	-	-	100
VLLGGGNPLTLEAGFR	0.542	0.509016	0.604	0.4367286	0.20542	792.0	0,06	0,61	Poor	6,36	0	0,23	1 - 4 (NI)	100	18.75	-	81.25
VPTANVSVVDHKGHA	0.283	0.121013	0.45	0.29033	0.18754	760.79	-0,06	0,54	Poor	7,26	1	0,44	6 - 9 (PA)	100	-	26.67	73.33
AVRLPHWNLN	0.573	0.55082	0.535	0.58544934	0.25611389	789.11	-0,13	0,53	Poor	10,11	1,5	0,39	7 - 10 (NI)	100	-	-	100
DVKESDAARAD	0.455	0.0717502	0.495	0.27162	0.23247156	773.0	-0,42	0,65	Good	4,23	-2	0,67	2 - 5 (NI)	100	54.55	-	45.45
LVLLANNCGGLLP	0.505	0.676565	0.47	0.45670402	0.24117279	764.17	0,19	0,59	Poor	5,85	0	0	1 - 4 (NI)	100	-	30.77	69.23
GMGFVDFNTPVSSGM	0.270	0.514491	0.465	0.42349318	0.20723329	777.0	0,08	0,66	Poor	3,8	-1	0	4 - 9 (NI)	100	-	6.67	93.33
ALEPNAAGALQ	0.456	0.267449	0.534	0.40010238	0.26993537	762.5	0,02	0,57	Poor	4	-1	0,23	7 - 10 (NI)	100	18.18	-	81.82
LLEGENAHLTQKY	0.550	0.131258	0.551	0.48618275	0.26478961	779.75	-0,17	0,58	Good	5,41	-0,5	0,69	9 - 13 (NI)	100	-	-	100
DDEVNVNGTVELMNSP	0.406	0.139919	0.447	0.43836743	0.185557	696.53	-0,16	0,67	Good	3,44	-4	0,16	4 - 10 (NI)	100	-	18.75	81.25
WLLNNLGTSKP	0.529	0.269886	0.527	0.41256161	0.22676934	768.6	-0,07	0,58	Poor	9,11	1	0,33	1 - 6 (NI)	100	9.09	-	90.91
AVLDLGNNANQL	0.444	0.20335	0.417	0.39039311	0.30818963	773.18	-0,04	0,64	Poor	3,8	-1	0,1	2 - 5 (NI)	100	-	-	100
QDFLVTQVENEGKGSK	0.515	0.113151	0.479	0.38976109	0.17927	740.87	-0,26	0,67	Good	4,68	-1	0,77	3 - 8 (NI)	100	-	37.50	62.50
VYLAQTVEY	0.444	0.0487558	0.57	0.40425381	0.19049	689.0	0,05	0,64	Poor	4	-1	0,28	1 - 7 (NI)	100	-	-	100

1 - PreAIP: Peptides were subjected to calculation via http://kurata14.bio.kyutech.ac.jp/PreAIP/, where the probability of the peptides to exert anti-inflammatory was estimated based on different types of features including primary sequence, evolutionary and structural information through a random forest classifier (thresold to be considered as highly antiinflammatory > 0,468).
2 PeptideRanker - The likelihood for the peptides as bioactive was evaluated by PeptideRanker (http://bioware.ucd.ie/~compass/biowareweb), a server to predict bioactive peptides based on a novel N-to-1 neural network, by giving scores ranging from 0 to 1. Higher score indicated the greater the likelihood of the peptide being bioactive.
3 PreTP-Stack: The anti-inflammatory potential of the peptides was also estimated with PreTP-Stack (http://bliulab.net/PreTP-Stack/server), which is based on the stacked ensemble learning, by giving scores ranging from 0 to 1. Higher score indicated the greater the likelihood of the peptide being anti-inflammatory.
4 - AnOxPePred tool (http://services.bioinformatics.dtu.dk/service.php?AnOxPePred-1.0) uses deep learning to predict the antioxidant properties (quantified by free radical scavenging and ion chelating scores) of peptides by giving scores ranging from 0 to 1.
5- SCMB3PP - it allows the prediction and characterization of blood-brain barrier penetrating peptides using estimated propensity scores of dipeptides, server available from here: http://pmlabstack.pythonanywhere.com/SCMB3PP
6 – Physico-chemical characterization was estimated with ToxinPred : via https://webs.iiitd.edu.in/raghava/toxinpred/design.php/
7- The web server PASTA 2.0 (http://protein.bio.unipd.it/pasta2/) was implicated to compute the tendency of peptide self-aggregation specific to the possible region at sequence (with the recorded number starting from N-terminus). For peptide discrimination, the optimal thresholds were switched as Top = 1 and Energy < - 5 PEU (1 PEU (Pasta Energy Unit) = 1.192 kcal/mol). NI: no amyloid predicted; PA: parallel aggregation computed. The probability of intrinsic disorder and portion of estimated secondary structure that complement the aggregation data were also reported.

All these tools were accessed on 24th November 2023 for the last time.