

ผศ.ดร.รักฤดี สารธิมา ได้รับรางวัล

Outstanding Young Scientist Poster Presentation Award

ผลงานวิจัยเรื่อง: Angiotensin-I converting enzyme inhibitory activity of
peptide from *Volvariella volvacea* mushroom

จากงานประชุมวิชาการระดับนานาชาติ

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Angiotensin-I converting enzyme inhibitory activity of peptide from *Volvariella volvacea* mushroom

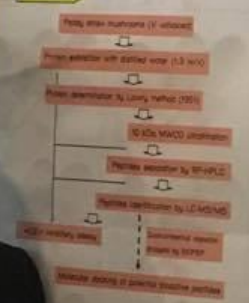
AWARD

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Background:

Angiotensin converting enzyme (ACE) inhibitors have been reported to reduce hypertension. ACE-I inhibitors derived from natural sources such as food proteins are primarily acceptable and better to be eaten. Some edible mushrooms have been reported to have blood pressure lowering effect after consumption. Paddy straw mushroom, *Volvariella volvacea* is one of the most popular edible mushrooms, cultivated throughout East and Southeast Asia. The species is rich in essential nutrients including peptides and proteins and has also been reported antihypertension activity. However, the bioactive compound responsible for such activity has not been identified. The current research aimed to isolate and characterize ACE-I inhibitory peptides from *V. volvacea* based on the bioassay guided purification steps.

Methods:



Results:

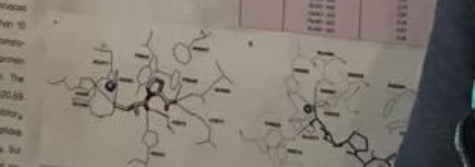
The potential identified ACE-I inhibitory peptides were subjected to gastrointestinal digestion. According to BOPPEP analysis, GDRPSGHYF was hydrolyzed by chymotrypsin at C-terminal end and released octapeptide, GDRPSGHYF as ACE-I inhibitor. Whereas GDRPSGHYF after digestion, it was predicted to release two ACE inhibitory tetrapeptides, GDFL and SGHY from its precursor. All peptides were done molecular docking with human ACE-I comparison to known synthetic hypotensive agent, Captopril. The binding energy of each peptide of ACE-I active site are as shown in Table 1 and the H-bonding of the most potent *V. volvacea* peptide, GDFL at the active site of ACE-I are as shown in Table 2. The result suggested that the mode of action of this peptide might be competitive.

Table 1: The binding energy of the peptide and captopril on the binding site of ACE-I (PDB: 1SMA)

Peptide	Activity energy (kcal/mol)	Captopril	Hydrophobic	Hydrophilic	Total energy (kcal/mol)
GDFL	-6.12	-7.68	-2.45	-1.15	-3.60
SGHY	-4.85	-6.12	-1.75	-0.85	-2.60
Captopril	-7.25	-8.15	-2.85	-1.35	-4.20

Table 2: The hydrogen bonding interaction of the peptide (GDFL) at the binding site of ACE-I (PDB: 1SMA)

Atom	Distance (Å)	Angle (°)
Asp198	2.85	115.5
Asp198	2.95	115.5
Asp198	3.05	115.5
Asp198	3.15	115.5
Asp198	3.25	115.5
Asp198	3.35	115.5
Asp198	3.45	115.5
Asp198	3.55	115.5
Asp198	3.65	115.5
Asp198	3.75	115.5
Asp198	3.85	115.5
Asp198	3.95	115.5
Asp198	4.05	115.5
Asp198	4.15	115.5
Asp198	4.25	115.5
Asp198	4.35	115.5
Asp198	4.45	115.5
Asp198	4.55	115.5
Asp198	4.65	115.5
Asp198	4.75	115.5
Asp198	4.85	115.5
Asp198	4.95	115.5
Asp198	5.05	115.5
Asp198	5.15	115.5
Asp198	5.25	115.5
Asp198	5.35	115.5
Asp198	5.45	115.5
Asp198	5.55	115.5
Asp198	5.65	115.5
Asp198	5.75	115.5
Asp198	5.85	115.5
Asp198	5.95	115.5
Asp198	6.05	115.5
Asp198	6.15	115.5
Asp198	6.25	115.5
Asp198	6.35	115.5
Asp198	6.45	115.5
Asp198	6.55	115.5
Asp198	6.65	115.5
Asp198	6.75	115.5
Asp198	6.85	115.5
Asp198	6.95	115.5
Asp198	7.05	115.5
Asp198	7.15	115.5
Asp198	7.25	115.5
Asp198	7.35	115.5
Asp198	7.45	115.5
Asp198	7.55	115.5
Asp198	7.65	115.5
Asp198	7.75	115.5
Asp198	7.85	115.5
Asp198	7.95	115.5
Asp198	8.05	115.5
Asp198	8.15	115.5
Asp198	8.25	115.5
Asp198	8.35	115.5
Asp198	8.45	115.5
Asp198	8.55	115.5
Asp198	8.65	115.5
Asp198	8.75	115.5
Asp198	8.85	115.5
Asp198	8.95	115.5
Asp198	9.05	115.5
Asp198	9.15	115.5
Asp198	9.25	115.5
Asp198	9.35	115.5
Asp198	9.45	115.5
Asp198	9.55	115.5
Asp198	9.65	115.5
Asp198	9.75	115.5
Asp198	9.85	115.5
Asp198	9.95	115.5
Asp198	10.05	115.5

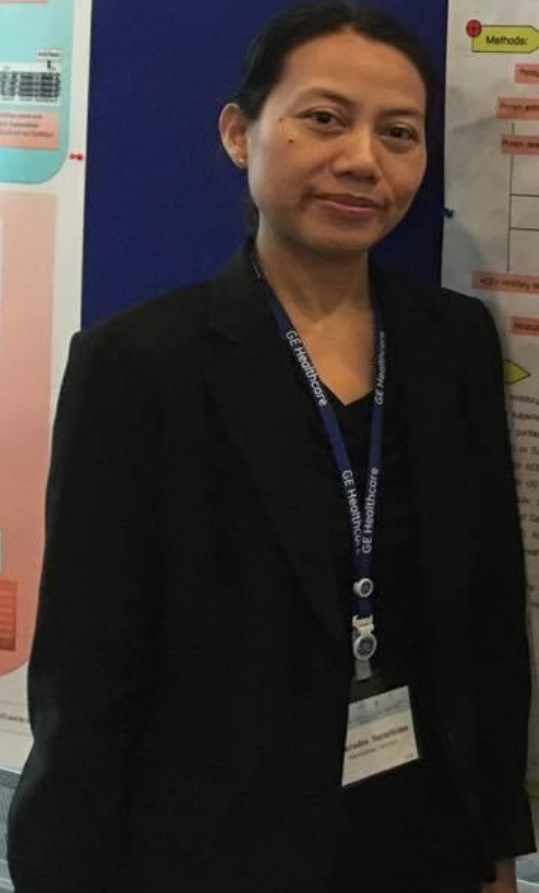


Conclusion:

Peptides with ACE-I inhibitory activity from paddy straw mushroom potential source for development of functional foods as an antihypertensive study. ACE-I inhibitory peptides will be chemically synthesized and evaluate their inhibition patterns.

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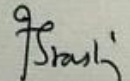
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Rakrudee Sarnthima



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