C. S. FODEN, S. ISLAM, C. FERNÁNDEZ-GARCÍA, L. MAUGERI, T. D. SHEPPARD, M. W. POWNER* (UNIVERSITY COLLEGE LONDON, UK)

Prebiotic Synthesis of Cysteine Peptides that Catalyze Peptide Ligation in Neutral Water Science 2020, 370, 865-869, DOI: 10.1126/science.abd5680.

Cysteine-Catalyzed Peptide Synthesis in Neutral Water

	_				
Н-АА-Х	Ac-Gly ^N - AA-X yield/%	Ac-Gly- AA-X yield/%	H-AA-X	Ac-Gly ^N - AA-X yield/%	Ac-Gly- AA-X yield/%
H-Asp-OH	58	-	H-Gly-NH ₂	21	52
H-Gln-OH	56	-	H-Arg-NH ₂	14	56
H-Glu-OH	58	-	H-Asp-NH ₂	6	58
H-His-OH	73	-	H-Glu-NH ₂	-	64
H-IIe-OH	55	-	H-His-NH ₂	-	67
H-Leu-OH	53	-	H-IIe-NH ₂	12	47
H-Pro-OH	58	-	H-Met-NH ₂	5	62
H-Trp-OH	32	5	H-Tyr-NH ₂	3	62

Significance: Cysteine is very attractive due to its high reactivity as a nucleophile. The authors found that acylated cysteine can be synthesized in a prebiotic approach and used as a catalyst in the catalytic peptide ligation pathway to prepare oligopeptides.

Comment: With the cysteine as a catalyst, various dipeptides can be synthesized in neutral water. When 3-mercaptopropionic acid was used instead of cysteine, oligopeptides could also be prepared in a similar thiol-catalyzed peptide-ligation manner. The yields of the target peptides are moderate to good.

SYNFACTS Contributors: Hisashi Yamamoto, An Wu Synfacts 2021, 17(02), 0225 Published online: 20.01.2021 **Peptide Chemistry**

Key words

cysteine peptides catalytic peptide ligation

aqueous media

