

THE UNIVERSITY OF WISCONSIN

MADISON 6

INSTITUTE FOR ENZYME RESEARCH
1702 UNIVERSITY AVENUE

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(Handwritten signature)

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Dear Francis:

Thank you for your letter of the 6th of April. First, about the Gordon Conference, we should be able to pay \$400.00 plus the living expenses for the week. I certainly look forward to seeing you there.

I was on the point of writing to you about recent results. There is really a great deal that I want to tell you and I may have to follow up with another letter. What Jim wrote to you is correct, but really when he was here the experiments hadn't been finished and even now, the analysis of the peptides is not complete. In the meantime, the experiments on the incorporation stimulated by poly UC, poly UG, poly AC and poly AG are on enclosed photographs 1-4. They do show interdependence for two amino acids in each set. Poly AG does incorporate arginine and glutamate. Arg is AGA, consistent with the results from homopeptide synthesis (stimulated by poly AAG, photograph 5) and also GAG is glu. Both GAG and GAA triplets stimulate binding of glutamyl-sRNA.

AGA trinucleotide does not give any binding of arginyl-sRNA as I wrote before, but as you will see from the enclosed list of codon assignments, other triplets stimulate binding of arginyl-sRNA.

So far as identification of copeptides is concerned, in addition to seryl-leucine, we have worked with presumed (glu-arg). ~~On~~ Tryptic digestion gives two ^{to three} peptides which we assume to be glu-arg and dimer of that. We should soon complete identification by Edman degradation.

In case of (cys-val)_n, we have done kinetics of H⁺ hydrolysis after oxidation to cysteic acid and we find as a major dipeptide valyl-cysteic acid. *we spent a long long time on this one - but have now decided to be contented with kinetic hydrolysis results. Haven't been able to make other techniques or even proteolytic*

We have also done a lot of binding studies and a list of results is given on the enclosed sheet. In particular, note the enclosed photographs 6 and 7. Asp-sRNA binding is stimulated by poly AAG and this binding does not appear to be due to wrong sequences ⁱⁿ ~~in~~ poly AAG. ~~As~~ seen on photograph 7, ^{even} the trinucleotides of ~~the~~ stimulated binding although at higher Mg⁺⁺ concentration. *Especially GAA*

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We are still trying to write at least part of the total work and would like to submit them to J. Mol. Biol. as soon as we can and I would write to you again about this and, of course, send you copies right away.

Yours sincerely,

Gobind

H. Gobind Khorana

HGK:gs

- P/s.
- (1) Like to hear further your views on trying to get at total nonsense. We are now actively working on making repeating tri- and tetra sequences + with DNA polymerase making DNA-like polymers from them. Don't know yet how it goes.
 - (2) Re. your question, in peptide synthesis, do other amino acids go in ⁱⁿ small amounts? As far as we know, they don't. But it would be a big project to do this quantitatively and rigorously and we would have to start on this systematically. You will have our ^{present} data on this soon, I hope.
 - (3) I don't know about Fresco's results. I saw him recently + he merely said that his results agreed with ours but that since deamination of $(AU)_n$ was not complete, he got other amino acids in too. We had tried deaminations of poly AU too but hadn't clean results. At the moment, I am reluctant to accept the data unless I see the actual characterization of $(AU)_n$.
 - (4) I am also enclosing obj's glutamate synthesis using Poly AAG. The radioactive band between (Glu) and Gln turns up in Control & Doty's lab. tells me that they have seen it too. probably glutamate and

CODON ASSIGNMENTS FROM BINDING
AND/OR POLYPEPTIDE SYNTHESIS

<u>Amino Acid</u>	<u>Codons</u>
Ala	GCC
Arg	AGA*, CGC, CGA
Cys	UGU ^o
Glu	GAA, ^o GAG ^o
Gly	GGC
His	CAC, ^o CAU
Ileu	AUU, AUC, AUA
Leu	CUC*
Lys	AAA, ^o AAG, ^o UAA
Pro	CCA
Ser	UCU ^o
Thr	ACA, ^o ACU, ACC
Tyr	UAU, UAC
Valine	GUG, ^o GUU

(April 8th)

(This is a list put together last week and soon we should add to it a good deal.)

N.B. In the above assignments, those triplets without any notation, assigned by us from binding studies; those with o on them, on the basis of, both, binding and polypeptide synthesis; those with *, on basis of polypeptide (homo and/or copeptide) and fail to give binding.