

4:10 - 4:50

① Return to Book 2
Tally

July 1966 Boulder
Fund
NRP Tall

I would like to describe the
basic ~~major~~ concepts of the genetic code.

~~to be a possible~~ Discussion will be

~~limited to principles rather than data,~~
and most ~~and~~ attention will be focused upon
recent studies relating to the fine
structure of the code, that is base sequence
of codons & ^{special} ~~the~~ functional codon.

mitt

On the ~~first~~ 1st slide, ~~the~~ transcription
& translation are shown diagrammatically.
Only one strand of DNA is transcribed
into RNA. The transcribing enzyme
must select the strand of DNA to be read.
RNA polymerase, must recognize some
feature of DNA which means that here & stop here.
Mechanisms are unknown.

2) A
C
G
U

4 letters.

a) ~~single double triplet~~

A
U
C
G

b) Direction of Reading a polynucleotide

c) Phrasing

ACGU
The
only
sol.

d) single 4
double 16
Triplet 64

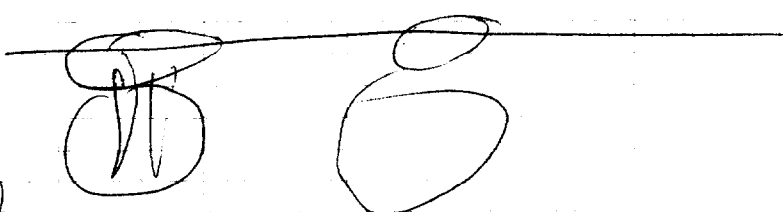
e) 3 letters Nucleic Acid = 1 letter (AA) polymer

3) ~~XXXXXXXXXX~~

Terminal codons

4) Specificity is imparted at many levels

A
C
↓



act my
Several experimental approaches have been used to translate the code

a) Summary Patterns
1) # ~~Hydrophobic~~ / AA

b) F-Met. - Initiation
1) 2 species MetSRM.

2) Mauerst & Berger

3)

	Formyl	Code	Part	Start
MetSRM ₁	+	UAG AUG UAG	F Met	Leu Met Leu Met
" 2	-	AUG		Met

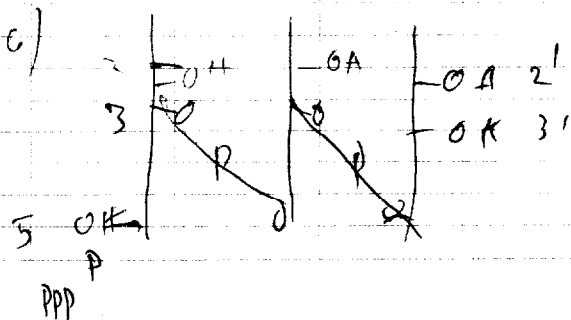
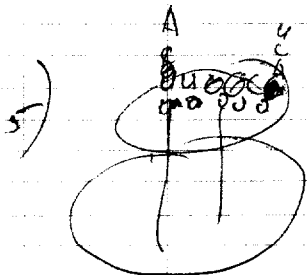
c) Initiation
~~Initiation~~

Term-Init

Term

mRNA

- 1) Terminal & Ant. initiation - Mechanism?
- 2) " " " term



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Position of Tind (C)
Base of Tind - Beckmull - Lac operon
HX / Refers / accept /
tem.
Position effect.

5/11

11) Termination

1) UAA
(UAG?)

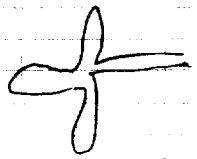
2) UGA

Beckmull

* 12) Mechanism Codon Rec.

1) Halleyella SRM

GCU 47-1
 C
 A
 G

2) 

1) Ser	Halley
Ser 1	Zach
Ser 2	"
Tyr	Madison
(Phe)	Ribon

3) wobble

13) SRNA modification

1) A → I ← G

2) 2 Leu SRM

14) Universality bacterial, archaeal, mammalian SRM

1) Res - High
 Dec - low
 Kellm High

2) highly Universal Code

* 15) Differences between active systems

1) E. coli is amplifiable strains.

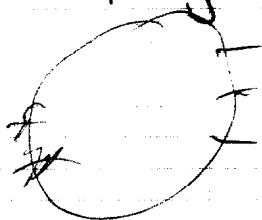
2) Evolution
3000 Mill. Fossil Bacteria

Containing Prolog
cells generated

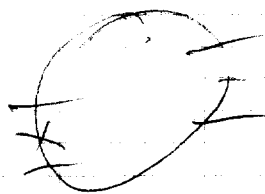
{ 500 " Invertebrate Phyl. - 1st Vert almost Fossil
353 " 1st amphibians
181 " 1st mammals

3) Large numerical order - subtle diff. possible

16) Karyofsky - Tryptophan Synthetase



arg.



arg. try
50%

17) Brenner, Casan, Zinder

1) UAG

UAG Term 100%

2) UAG

" " 50% + 50% per UAG

3) UAG

" " Gln CAG

4) UAG

" " Tyr UAG

5) UAG

" " Trp UAG

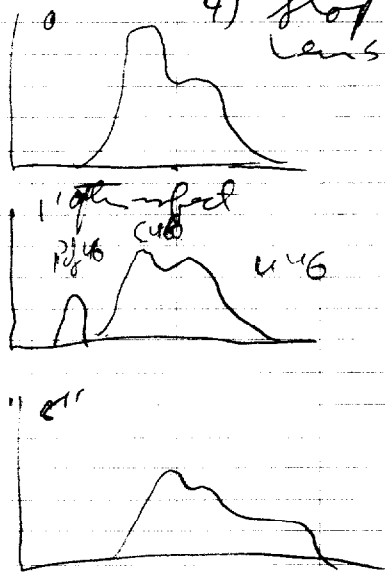
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18) Boris Davis & Gilbert SM.



19) Linder

- 1) Infect to play
- 2) Protein Syn.
- 3) Modify host lens RNA - Not alter SM.
- 4) Stop host Protein Syn.



20) much very exciting

- 1) Hanzel Unimol
- 2) subtle Modifiers
- 3) Profound Effects cell growth & differentiation
- 4) ^{met.} Regulation
- 5) ~~cell differentiation~~
- 5) Virus infection

21) ~~In conclusion~~
 Another ~~very basic~~ ~~concepts~~ ~~used in~~
 genetic information ~~process~~ ~~which~~
 may be useful for

~~19) ... Term~~

20) Brauer-Lane Term Supp

21) Unimodality

22) Diff

23) Jordan Phys

~~24)~~

Boulder (9)

Return Boulder - End of
still holds Final talk

In conclusion one may ask:

27) Are there ~~any~~ basic ~~some~~ principles of interest to neurobiology that can be derived from ~~a study of genetic~~ ^{the information now} available on the genetic code?

1) Dr. Davis clearly stated ~~the~~ ^{only} the most important principles. Complexity achieved by few basic units, combined in different sequences.

2) ~~Primitive organisms may use some~~ ^{ON} ~~of primitive as well as highly developed~~ ^{the} mechanisms ~~used~~ ^{that} ~~of primitive as well as highly developed organisms.~~

1) Selective pressure

2) Patterns may change but mechanisms ^{are} ~~likely~~ to be altered only slightly.

3) Davis' evidence, 'Address info', Retain much of old. activate & deactivate patterns

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and the last point is simply an article of faith, shared, I am sure, by most if not all people in the room, ~~that~~ ^{may still} ~~on~~ ^{of} ~~fundamental~~ ^{fundamental} ~~aspects~~ ^{aspects} ~~of neural info storage~~ ^{of neural info storage}, ~~that~~ ^{that} ~~will ultimately be revealed by direct~~ ^{will ultimately be revealed by direct} ~~experimental approaches~~ ^{experimental approaches} ~~that~~ ^{that}

~~been used to clarify genetic information processing, & continued experimentation will ultimately reveal many additional fundamental aspects of neural information storage & retrieval.~~

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