6/10/67

Research problems for Pertel etc.

Embryology

1) Do all cells contain same amt of DNA? Diminution: which DNA is lost.
Test various hybridization,
Prepar'n DNA diff times. Hybridize
a) [illegible] cells DNA
b) DNA turnover (Daughters ting)

2) Prot, RNA, DNA syn. at diff stages. Don Brown sort of thing using [illegible] eggs. (Ascaris)
Determinate egg.

3) [illegible] Prot syn. vs Time

4) ERNA vs Time (early)

5) Oogenesis — Diff stages of egg formation easily obtained. Take eggs from diff parts of uterus.

2) Unusual aspects of Nematodes

1) Eutely — cell position, # of lineage

3) Determinate embryology
a) DNA diminution — Cast off? Degraded? [illegible] used? Is same portion of DNA lost in each time?

4) Ascaris forms enormous quantities of eggs. Synchrony

5) Small # neurons.

Research Problems Measuring Neuron samples

1) Assuming — Aspect Dye. Determ
neuron ~~cell~~ boundaries.

2) Get Mutants (behavioral). Correlate
with diff in neuron samples
a) Development of [illegible]
~~2)~~ * b) ♂ ♀ diff in neuron samples
Correlate with behavior.

3) Get developmental mutants Tubby
or Paralysis
or [illegible]

Research Problem

I Behavior & Genetics

1) Identify tropisms & taxis & sensitivity to chemicals.

   a) chemo.

   electo

(A) 1) Devise selection techniques.

2) Get mutants (with opposite taxis.

   a) Also mutant with no taxis

Methods 1) Mutant

1) Expose to F-2-3 in Batch cultures.

2) Use selection technique

3) Clone or single pair mating

3) Crosses from each mutant.

   1) M x wT (homozygous?) — ♀ x wT

   2) M_1 x M_1 M_2 (any wT recomb.) — same

   x M_3

   x M_4

   x M_5

   x M_6

   etc

   M_2 x M_1

   M_2

   M_3

   etc

M	1	2	3	4	5	6
1	x	x	x	x	x	x
2	x	x	x	x	-	-
3						
4			etc.			
5						
6						

II Anatomy

1) ~~EM~~ Light Microscopy of Nervous system & entire body

2) EM of synapses: Morphology

III Neurophysiology & physics

1) Classes

1)

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Pertel

1) Eggs of C. briggsae

1) Prot. Synth.;

2) H^3 DNA form. eggs.

Sperm.

C^{14} 1) RNA from diff tissues of adults C. briggsae

2) Trace cell lineages of ~~neurons~~ ~~Pertel~~. Map Neurons.

1) Radioautography H^3 Thymidine

1) Plot → 2) Pro

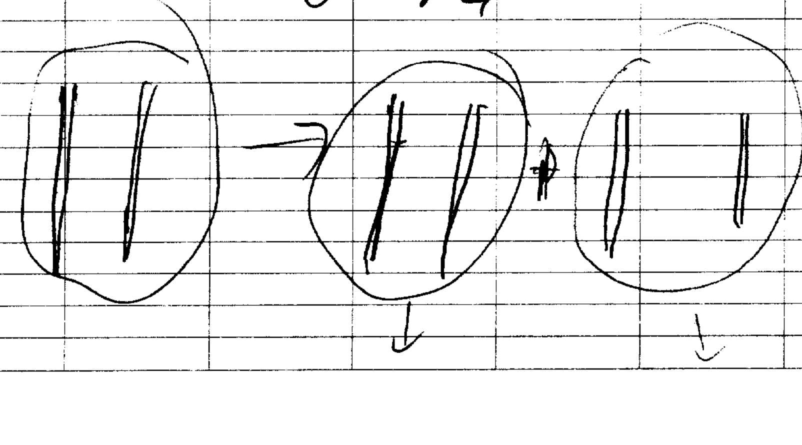
1) Order cells vs Time, Pulsed H^3 T at diff times of embryo development ± Vellan Follow by days of unlabeled T.

Pulsed

Also try H^3 AA H Leu

Uridine

2)



Protein in [illegible] during development, ~~Nematodes~~ ~~[illegible]~~ Drosophila!

[illegible] [illegible] on [illegible]., Archived sent

Van Boven

6/24/67

Mon.

1) Rental – ~~Development of~~ ~~Protein Synth.~~ Organism

2) ~~[illegible]~~ Labeled Uridine } into Ovary
Thymidine) 2) Incubating
AA
~~to labeled~~ eggs; Sperm

3) ~~[illegible]~~ fertilized eggs on sl. with labeled
~~Uridine~~
Thymidine a) Kand Fail
AA
~~[illegible]~~

1) Det. time of RNA synth.
a) Class of RNA. ← RNA
m

2) DNA

3) Protein.

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Best Ideas for Selection - Chemotaxis

1) Need mutants which have opposite taxis, better than those which have no taxis.

* 1) Opposite taxis — Neuronal pathway scrambled but some neuronal pathway still acting & receptors still acting

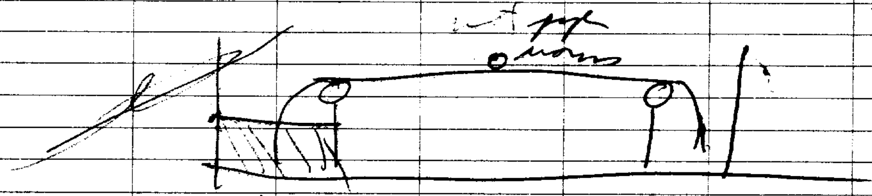
2) No taxis — 1) Permeability change
2) Receptor cells changed
3) Block in pathway
4) Block in effector pathway

2) Find chemotactic agents.
1) Steroids
2) AA
3) Cutting fluid.
4) Other nematodes (opposite sex) (individually) (in agar) Dialysis bag / Squashed worms
5) pH
6) Nucleotides
7) C Briggsae med.
8) E. coli plaques.

(Note. Previously has found taxis to amino acids.

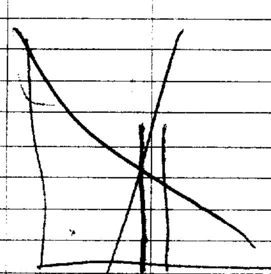
9) Light?
10) Electric current

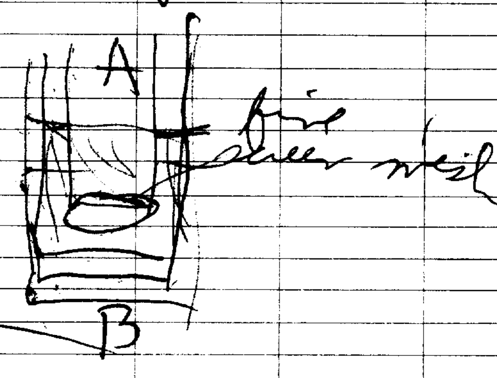
11) direct H_2O or salt flow. (Chromatography paper.)



Idea 12) ~~Touch taxis - enter capillaries if touch.~~ Or ~~not enter~~ capillaries if touch (not random choice

or Go thru first screen OOOO
vs not go thru first screen





1) ~~Start with adults only.~~
then worms to sieve for ~~[illegible]~~ after trial.

1st stopcock	open	closed
2nd "	closed	open

2) after trial