

3. Start to grow cells up for in vivo select
work. Need to do.

4. ~~Cloned~~ ~~in~~ ~~2~~ ~~days~~ (Fed)
Do ~~not~~ ~~know~~ ~~of~~ ~~cells~~ ~~to~~ ~~be~~ ~~very~~ ~~many~~ ~~diff~~
~~of~~ ~~cells~~. (only ~~strong~~ ~~consider~~)
so must be ~~rigid~~ ~~out~~ ~~by~~ ~~accident~~.

5. ~~boxed~~ - set up mail to & deal out sleep
before using - Benin
Boxes - Contain - Rules

6. Boxes - ~~the~~ ~~of~~ ~~rest~~ ~~for~~ ~~the~~ ~~evening~~
Need bigger boxes 3x higher
50x100x100. Use boxes for all work
of ~~for~~ ~~the~~ ~~labor~~ ~~or~~ ~~for~~ ~~the~~ ~~desired~~

7. by the time of the year
to ~~most~~ ~~exp~~ ~~date~~ ~~for~~ ~~the~~ ~~year~~ ~~for~~
~~public~~ ~~interest~~

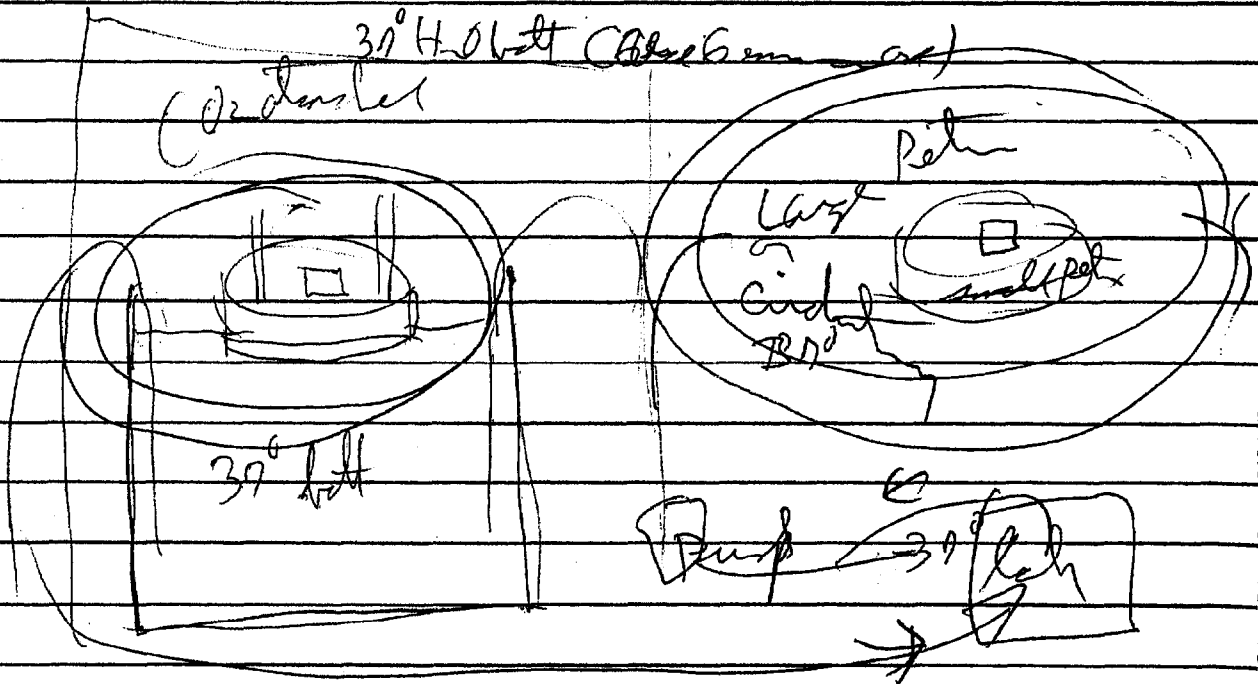
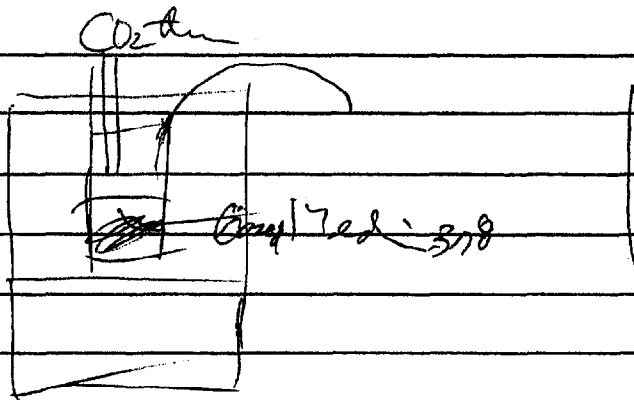
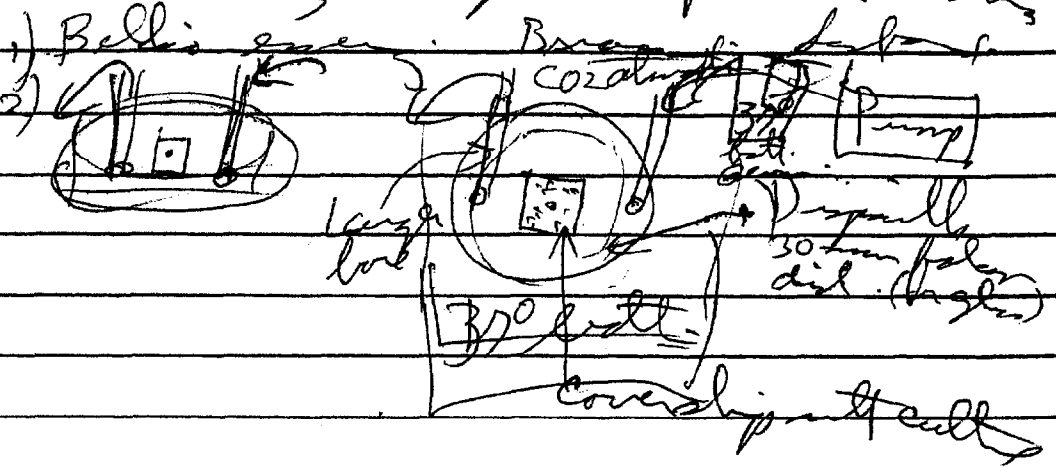
2. Notes - ~~Timing~~ ~~of~~ ~~work~~
- ~~Ways~~ ~~to~~ ~~do~~ ~~it~~
1. Neurobiology of doublets. Do 1st
Also gain info on single cells ~~sum~~ ~~of~~

using ~~the~~ ~~same~~ ~~ant~~ cell on it. Put in 30 min ~~in~~ ~~disk~~ + 1.0 ml.

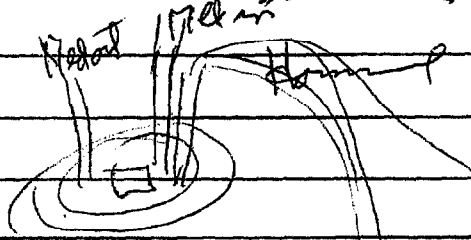
4. ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~8~~ ~~9~~ ~~10~~ ~~11~~ ~~12~~ ~~13~~ ~~14~~ ~~15~~ ~~16~~ ~~17~~ ~~18~~ ~~19~~ ~~20~~ ~~21~~ ~~22~~ ~~23~~ ~~24~~ ~~25~~ ~~26~~ ~~27~~ ~~28~~ ~~29~~ ~~30~~ ~~31~~ ~~32~~ ~~33~~ ~~34~~ ~~35~~ ~~36~~ ~~37~~ ~~38~~ ~~39~~ ~~40~~ ~~41~~ ~~42~~ ~~43~~ ~~44~~ ~~45~~ ~~46~~ ~~47~~ ~~48~~ ~~49~~ ~~50~~ ~~51~~ ~~52~~ ~~53~~ ~~54~~ ~~55~~ ~~56~~ ~~57~~ ~~58~~ ~~59~~ ~~60~~ ~~61~~ ~~62~~ ~~63~~ ~~64~~ ~~65~~ ~~66~~ ~~67~~ ~~68~~ ~~69~~ ~~70~~ ~~71~~ ~~72~~ ~~73~~ ~~74~~ ~~75~~ ~~76~~ ~~77~~ ~~78~~ ~~79~~ ~~80~~ ~~81~~ ~~82~~ ~~83~~ ~~84~~ ~~85~~ ~~86~~ ~~87~~ ~~88~~ ~~89~~ ~~90~~ ~~91~~ ~~92~~ ~~93~~ ~~94~~ ~~95~~ ~~96~~ ~~97~~ ~~98~~ ~~99~~ ~~100~~ ~~101~~ ~~102~~ ~~103~~ ~~104~~ ~~105~~ ~~106~~ ~~107~~ ~~108~~ ~~109~~ ~~110~~ ~~111~~ ~~112~~ ~~113~~ ~~114~~ ~~115~~ ~~116~~ ~~117~~ ~~118~~ ~~119~~ ~~120~~ ~~121~~ ~~122~~ ~~123~~ ~~124~~ ~~125~~ ~~126~~ ~~127~~ ~~128~~ ~~129~~ ~~130~~ ~~131~~ ~~132~~ ~~133~~ ~~134~~ ~~135~~ ~~136~~ ~~137~~ ~~138~~ 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Handwritten notes

to Miss... setting. Perform - ch...



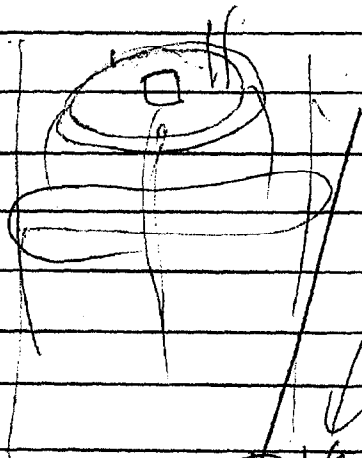
add home school - via syring



stroke
ad.

or just has input & change media. covered
top of dish. Cut & change media. covered

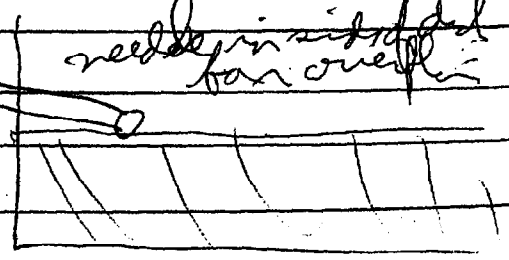
with syringe & then flush
flush with



Bellen

needle in side of dish
for output

To Vacuum



Best Control
Use Glass pot. When
so do you control it.

Q. 1000

1. Neurobiology system

1. Identify (naming core)

1) Thalidomide

2) Fyn Kinase

3) MAPK

4) GAP

5) Time dependent

6) False

Do any or cell pellets in vitro

3 months

* 2) Clones

2 months min. 2 clones (small) 2 clones (large)

Positive fls (know that)

2) Identify

2. Identify Neurotransmitters

1. Norep (C14)

2. Acetyl (C14)

3. GABA (C14)

2) Identify

Pharmacology

aim

Identify neurobiology system

Identify neurobiology system (aim) Pharmacology Identify neurobiology system aim

Procedures

1. Identify bio receptors

1) Neurobiology aim cell washing

2) 7 min antibodies test

50-500 μ l. Cover slip on filter support. All well drawn overfl.

2. Effect neurobiology selected stem cells aim cell wash

1) Blue aim C14 CO2

2) Pharmacology aim P32 incorp. 1) Neurobiology

9) Downy

~~Wing~~
~~tail~~
tail
tail

1. 6 days downy thousands feeding (efficiency)

* 2. 1st downy, 101st (Hundreds of Pfls)

a. 2) eff?

1) High ill selected against survival

c) Hundreds of downy

6-7 days downy, 101st (Hundreds of Pfls)
by 1st downy

3. Stage - Effect on bird, critical feed (Need 17 tanks)
with 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

2 1/2 days in anail

5 3 - 4 - 6 - 8 - 10 - 12 - 14 - 16 - 18 - 20 - 22 - 24 - 26 - 28 - 30 - 32 - 34 - 36 - 38 - 40 - 42 - 44 - 46 - 48 - 50 - 52 - 54 - 56 - 58 - 60 - 62 - 64 - 66 - 68 - 70 - 72 - 74 - 76 - 78 - 80 - 82 - 84 - 86 - 88 - 90 - 92 - 94 - 96 - 98 - 100

2 4. 1st downy

5 5. 1st downy

4 6. 1st downy

4 7. 2

4 8. 3

26 days

14 days downy on Viro for most purposes

1) Sell on outside turn

Adrenal medulla

- | | | |
|------------------------------------|--------------------|---------------------|
| | secretes | stimulates |
| 1. RA P ⁺ cells of ACTH | | |
| | (h) Growth Hormone | (may also produce) |
| 2. Non-chromaffin cells | 1) ACTH | 2) 3'-5' Cyclic AMP |
| | | 3) TPNH |
| 3. Intercellular cells | secret | No response to ACTH |

Epinephrine,
Norepinephrine,
Dopamine

Mast cells
Serotonin
Heparin
Histamine

Adrenal cortex

Testosterone

4/12/09

Neurobiology Problem

1. Downing - act - Amor (after predator)

a) bias

b) agon

c) selection cycles + downing agon agon.

Hard work but not with lots of 'close'?

2. Neurophysiology - Phil + Wayne + Fall - Win?

3. Molecular - Win + Nick - action potential

① Neurotransmitter synthesis - Enzyme levels - ^{types of cells?} ~~Metabolism of Synapse~~ _{synaptic / closed cell.}

② " + other molecules ^{storage} _{excitatory} Enzyme levels all - Grow to control operation ^{C10ATP mixture + C14Gluat (not apod.)}

③ " ^{apoptosis process} _{cellular} - Enzyme level ^{Paul Olden} _{of COMT}

④ Kind of Receptors

⑤ Synapse

- 1. Neurophysiology
- 2. Chemical Biology

⑥ Neurotransmitter levels

Use different 1. AcCh;

2. Norepinephrine - found (?) 14-22

3. GABA

4. ~~Glutamate~~ ^{Glutamate} ~~Glutamine~~ ^{Glutamine} - associated with multiple tumors

9. Mch. aspects of certain proteins - ignored later.

10. ^{Very important} ~~found~~ ⁱⁿ ~~cell~~ ⁱⁿ ~~neurons~~ ^{neurons} - Niche.

*** (1) Neurotransmitters (Enzymes, Acetylcholine, ^{Glutamate} ~~Glutamate~~ ^{GAD} ~~Glutamate~~ ^{Hydrox} ~~Hydrox~~)

*** (2) Neurotransmitters (if not among enzymes)

Norep.

serotonin

Dopa.

Histamine

Ep.

Tyramine

*** (3) Enzymes (Metabolism, hormones, (Dendrite specific

* 1. COMT

2. Two cholinesterase

3. Folate

4. Dies for hormones, cytochrome c, secret due to 1) ~~Chol.~~

2) Hormones

3) Cyclic AMP

4) Butyl Cyclic AMP

5. Vesicle Prep. & studies

6. Hypothalamic prep. "

7. Neurophysiol.

*** 11. Types of cells present. Kind of neurotransmitter

2. of each kind.

*** ~~Does~~ ^{Does} ~~cell~~ ^{cell} ~~synthesis~~ ^{synthesis} 1 hormone or 2 hormones.

*** ~~Does~~ ^{Does} ~~1~~ ¹ ~~cell~~ ^{cell} ~~give~~ ^{give} ~~rise~~ ^{rise} ~~to~~ ^{to} ~~2~~ ² ~~cells~~ ^{cells} ~~each~~ ^{each} ~~synthesis~~ ^{synthesis} a different ~~hormone~~ ^{hormone}.

~~Mat last questions~~

1. Action potential in neurone hypothesis. (Lambert)

12. Effect NGF - neur.

13. Effect conditions on synthesis of different neurotransmitters

1. Action potential - (ATPase?)

2. Choline Acetyltransferase

3. Trilobsterins

4. Norepinephrine? Tryp Hydro

5. COMT

14. Do all cells synthesize choline acetyltransferase?

- 6. Acetylcholinesterase
- 7. Norepinephrine
- 8. B
- 9. Serotonin
- 10. Histamine
- 11. GABA
- 12. Dopamine
- 13. Glutamate

Neurotransmitters

- * 1. Neurotransmitters
2. EP
3. Tyrosine
4. Dopamine
5. Me products
- a) Transient
- b) "Urinary"

* 6. Serotonin - Amino acid - PZ

7. Histamine

** 8. GABA

(9. Neurotransmitter of ATPase) - Edelman, Wajsbly

** 10. Need Synthesis assay for action potential

a) Neurotransmitter

b) Neurotransmitter release - Better than

c) Neurotransmitter effect on

synapse

11. Vesicle protein

** 13. Neurotransmitter 3100 Protein - Edelman

14. GABA

** 15. Molecular weight - Dendrite, postsynaptic

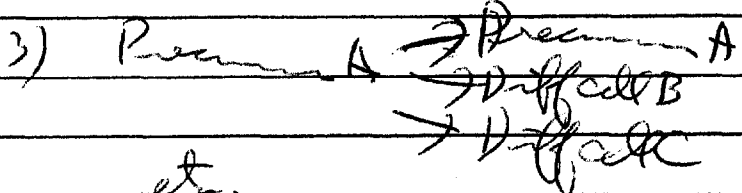
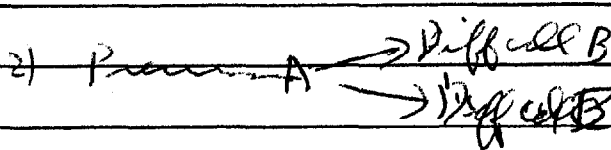
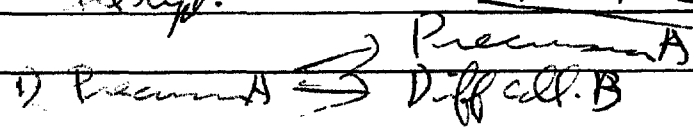
Northwest Quarter

1. Biology of Neurons

A. Different types of neurons (precursor cells) differentiate into different cell types.

STEM CELLS vs DIFFERENTIAL CELL

Neural Crest



Molecular Cloning of Diff Cells

*4) Diff cell A → (Diff cell A)

B. Identify molecules characteristic of different cell types

use the latter
equivalent to
do this.
improved.

1. ~~Ortho~~ proteins, enzymes, structural, etc.
2. Ion channels, receptors, molecules.
3. Action potential molecules.
4. Synaptic molecules.
5. Functional groups
6. " Axon-Homeostasis etc
7. " Neurotransmitter - " reaction
8. " action potential

9. Response to NGF

4/12/68 cont.

1. Identity of system

- 1. a) Neuron embryology Program for gene expression
 - 1) stem cell → diff cell. vs diff cell → (diff cell)
 - 2) Identity of molecules (genotypes)
 - 3) Order of gene expression Program for gene expression and differentiation
 - 4) Factors regulating gene expression
 - 1. hormones
 - 2. receptors

b) Glia Embryology?

- 1. Schwann cells etc.
- 2. Neuroblast → neuron
- 3. neuro + glia
- 4. Neuroblast

2. Neuron Function (Molecular terms)

Now # 1. Identify molecular numbers for each function

2. Ant of each molecule

Now # 3. Identify functions: How many functions are expressed?

3rd step 4. Identify functions: each function

3rd step 5. Identify molecular mechanism of functions

Now 6. Divide into class for neuron functions depends on potentials groups.

Plan
 1. ~~Identify~~
 Selection + Design } Answers

2. Identify all Markers (distances, activity) + work out new design

1. ~~Identify~~
 2. ~~Identify~~

1. ATP
2. SP12
3. Dent
4. Heart
5. 1kg \$100
6. Oct
- etc.

3. Neurophysiology - Action Potential
 1. ~~Identify~~) Synapse
 2. Wagon) Dendrite + action potential
 3.) Axon + + +

4. System for
 * Anatomy of neurons + Functions of neurons!

B. Functions of neurons only:

1. Design + analysis. diff. done -
2. Single cell analysis. - I could do into response
3. Get more functions of this type. - 40 etc.
- a) Not ~~sketch~~ explore more done

5) Single Cell Analysis ~~of~~ ~~single~~ ~~cells~~ ~~and~~ ~~clones~~ ~~North~~ ~~at~~ ~~10~~ ~~7~~ ~~...~~
 (01 clone of 100 cells) ~~Establish clones~~ ~~not~~ ~~feasible~~

1. Identify C¹⁴-labeled cells exactly (as first labeled cell)
2. Go Chromatograph
3. Enzyme numbers

Chemical analysis divide all (small clones)
 Analysis non-dividing cells
 " " cells that stick
 " " " float

Difficult except for mouse, need only ^{D-5} ~~few~~ ~~all~~ ~~genetic~~
 for clonal analysis ~~of~~ ~~them~~

c. Biology

1. Cell - G

F. Start with solid tumor - Purifying cells

1) OT assay

2) Dissect ^{cell} ~~per~~ ~~sample~~ - Tissue culture

3) Purify ^{dissect} ~~cell~~ ~~clone~~ ~~as~~ ~~sample~~ (How many days it all do ~~low~~ ~~number~~)

4) Establish cell lines using: 1st clone

5) Establish dose response

- 1) ~~Markers identify~~ Markers - ~~light~~ ^{various} ~~various~~ ^{in vitro}
- 2) Work out assay for ^{new} markers
- 3) Fate of markers ^{OT/In vivo}
 - 1) In vivo
 - 2) Cell Passage Comp.
 - 3) Clones from 1 cell
 - 4) " " established
 - 5) In vitro & In vivo

4) ^{all} Are markers in cell?

Number of cell types?

Bridges system - potentiality of cells:

Example: ~~are~~ all cells different? ^{to what}

extent? Can you get different genes ^{expressed}?

Are cells ~~pluripotent~~ ^{different} or ~~unipotent~~ ^{different}? (different ^{express})

* Spectrum of differentiated ~~stem~~ ^{different} ~~cell~~ ^{types}?

1. cloning + state - cloning - Anas.

2. Neurexophilus - Helan + Wangi -

3. ~~Wang~~ - 1) Neurexophilus
2) Bredem

4. Display

1. EOP } ~~state~~

2. Cloning } Anas.

3. Ident + cloning

4. Anas + Cloning

5. Anas + single cell

Molecular biology cell type
Extent of differentiation

heterogeneity of diff.

transcription process

what programs coexist
Programs that cannot coexist

5. Bredemitt

1. Identif markers.
2. Work with new assays + apply to polidite

3) ...

4) ...

3. single cell + clonal analysis

~~to check~~

Cell
4. Functions.

1. Brakes

2. Nerve

Divide

- 1. Therapeutic studies } Assess
 - 1. Learning
 - 2. Medication
 - 3. EOP
 - 4. Photos - Moulding
 - 5. Holding

2. Apply Asses. - Trainers

- 1. Roger
- 2. ~~John (Hunt)~~
- 3. Pat
- 4. ~~John (Hunt)~~
- 5. ~~John (Hunt)~~

3. Published Asses.

- 1. Perda
- 2. ~~John~~

4. Use of New Asses.

- 1. Norm + 194
- 2. Sam
- 3. Neil
- 4. (John)

1. Quest - Should you stop ^{planned} ~~up~~ TC work ^{temp.} ~~to explore NB system~~ ~~length, Payer, ...~~
1. ~~Answer - Yes~~

2. Quest - shift ~~high~~ ^{high} ~~to NB?~~ ~~Yes~~
~~and~~
~~find~~
~~answer~~

3. Q ^{Yes} Should Jan (+Joh) continue to work out ~~assess~~
for NB + TC problems rather than ~~quit out~~
TC data?

Should Payer quit out TC data or NB data?
Maybe Payer } quit out TC data. (An all)

Jan - ~~TC~~ ^{setting up publicly} ^{work out} ^{TC + NB}
Nick - ~~TC~~ ^{setting up publicly} ^{work out}
Win - ~~TC~~ ^{setting up publicly} ^{work out}
M + N - work out new ~~assess~~
PZ - set up ~~publicly~~ ~~early~~

Answers

4. Win ^{quit out} - New ~~win~~ ~~at~~ ~~Broken~~ ???
1. Bird in hand or bush? How long?
* # 2. Push best to quit out ~~renew~~
if can do fast. Then ~~switch~~ ~~to~~ ~~work~~
as soon as ~~possible~~ 3000 days.
3. Wayne helps ~~TC~~ ~~reg~~ ~~going~~ ~~shelley~~
work on NB problems

##

Idea - Neurophysi perfect of analysis
analysis: Electrical analysis
For biology of function

- a) Must have 2-3 complete Nerve ^{cell} ~~slips~~ ^{all components}
- b) used shifts 24 hr ^{Brain} ~~on~~ ^{on}
- c) Phil - Full time?

9. Idea) Can you do extracellular recording?

- 1. Solid tissue
- 2. TC 14 electrodes
- 3. Single cell electrode
- 4. Flotation
- 5. Packed (cont) plate

« What is quadrant ^{same} ~~method~~ ;

9. Can you get responses

10. Actus Descendit - Respiration
11. Paradoxus act - Potential

4. ~~Chad~~ ^{Chad} ~~Allen~~ ^{Allen} ~~ads.~~ ^{ads.}
Other numbers

1. Wini + Wags

1. Neurexins

- 1. Purification of protein
- 2. Single cell analysis
- 3. Cloning
- 4. Other interactions

2) SK-40 transposon
 3) Drosophila analysis
 5) Effect NBF on analysis

2. Cell cycle 16 hrs for neuroblast
 2 days

3. ~~Single cell~~ ~~analysis~~ ~~with~~ ~~thymidine~~ ~~effect~~
 3. Get back to baseline ~~23 min~~

1.

2. Drosophila Body

- 1. Drosophila
- 2. Diet in organ + dose
- 3. Diet - in up - into eyes + dose
- 4. EOP 1^o ~~single~~ ~~cells~~
- 1^o dorsal cells (from diet)
- 2^o " "
- 3^o " "

STEM CELLS Number of cells in dose that divide + feed back

* Number of cell during before growth

Rate of doubling: Variable

May have of dose

DIFF CELL A, B, C Group of 2^o dose. Variability in ~~Neurexins~~ ~~Neurexins~~

for (Jan)
Trial Markes & Pin down
3. Layer ~~of~~ ~~the~~ ~~same~~ ~~material~~ ~~used~~ ~~in~~ ~~the~~ ~~previous~~ ~~run~~

- 1) Dried cell - Tissue 1°
- 2) Lignin 1° + 20"
- 3) Cellulose 1° + 20"
- 4) Cellulose 1° + 20"
- 5) Flocculent
- 6) Starch
- 7) Dried cell (collected)
- 8) Nondyest ally
- 9) " " "
- 10) " " "
- 11) " " "
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- 50) " " "

- 1. Ch Acet.
- 2. GAD
- 3. Jay Hydr
- 4. S100
- 5. Starch
- 6. True Cellulose
- 7. Fiber "

Neil - Carol Andy - Chemil. New test

1. Es chemistry does ~~Handwritten notes~~ of Petter

* 2. Label ~~resemble~~ dose 1. ~~Handwritten notes~~ of Petter
Do not need pattern analysis
~ No data. ~~Handwritten notes~~ of dose (area). Tab. P. 1.
Label protein

1. ~~Handwritten notes~~ Hormones
with P >

3. All except ~~Handwritten notes~~ Label dose
Protein

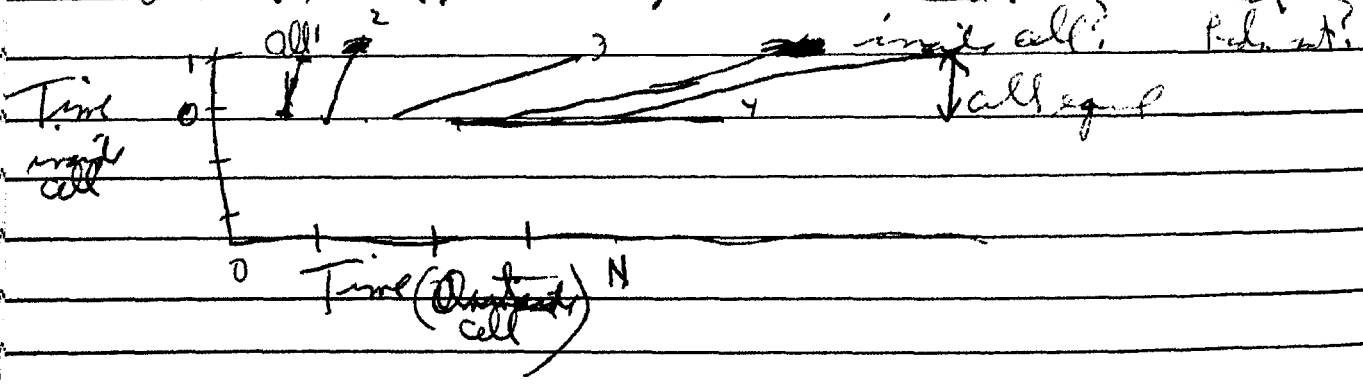
4/19/69

Biological Time

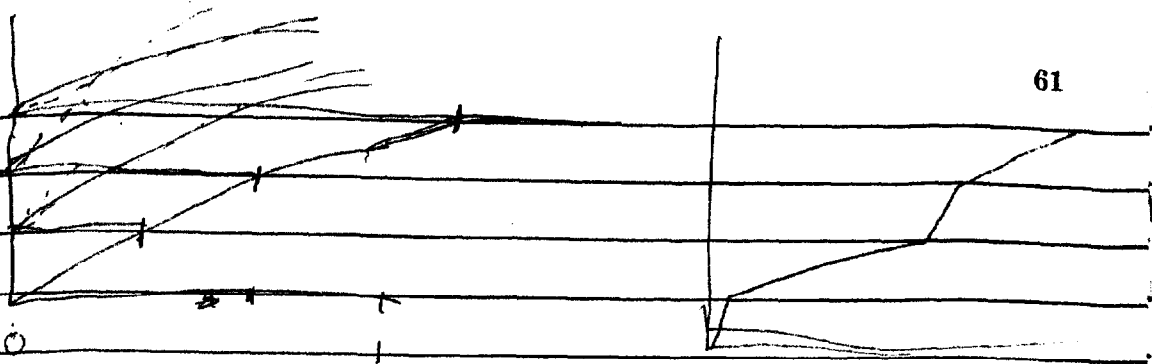
1-1000 fold, assuming time outside cell is 1.0

- 1. Biological time is ~~not~~ ^{can vary} ~~constant~~. Can define limits intervals between successive events. Can lead change unit 100-fold. Maybe 1000-fold. Individual ^{100 sec} ~~1000 sec~~.
 - 1. Change rate of net sections proportionally
 - 2. "Grand cell" "few" " " " ?
- 2. Zero time point. Can start at any time related to ^{initial point of cell} ~~initial point of cell~~
- 3. Echi growth time
 - 30 min
 - 3000 min

4. Time ^{scale} inside cell is different from time scale outside cell. Can't get time ~~related~~ ^{related} ~~meaning~~

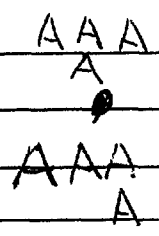
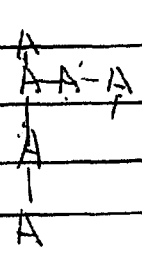
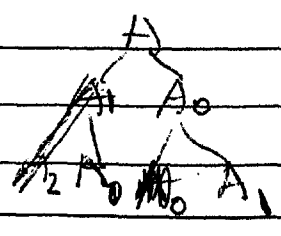
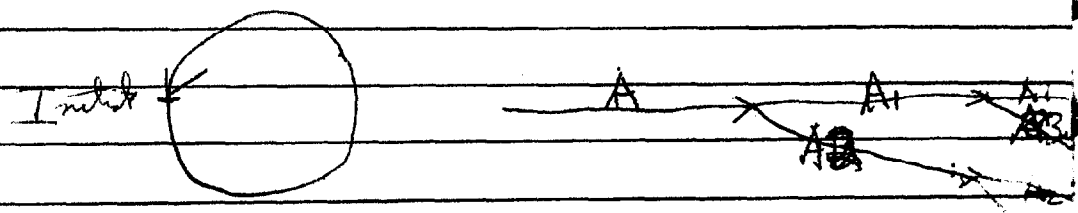


- 5. Time is function of temperature
- 2. " " " " Concentration of molecules
- 3. " " " " rate of reactions
- 4.



what section (gas using in digestion)
 maximum number of sections = 5×10^8 AA / 500 / sec.
 $= 400,000$ AA / sec.
 ≈ 1000 pulses / sec.

Inlet Biologi Tim ~~Outlet~~ Tim
 5×10^8 AA 5×10^8 AA



-) A
-) A
-) A
-) A

$A_2 A_1 A_0 A_0$

c. Maybe time inside cell is same. Velocity of light may be function of ~~some~~ interaction between photon & X particles. Distances they cover vary.

4/14/69

Action Potential - NB.

~ 40% of energy obtained by oxidative phosphorylation of brain + kidney cells is used for active transport!

~ $3\text{Na}^+ + 2\text{K}^+$ ions transported / 1 ATP \rightarrow ADP.

So, action potential in NB cells may be affected markedly by amt. of O_2 available.

* of NB low cell density for cell growth.

b) Check O_2 , CO_2 concentrations.

c) Check roller tubes or shaking or similar blood platelets, etc.

d) Make small amount of it

* Idea

Testing Na^+ , K^+ ATPase assay. Use as index of neuron viability.