

~~CPM~~

| R# | P# | TIME | CPM-1 | CPM-2 | |
|----|------|-------|--------|-------|----|
| 10 | 1 | 2.00 | 33.5 | 1C | |
| | 2 | 2.00 | 35.5 | | |
| | 3 | 2.00 | 37.0 | 1M | |
| | 4 | 2.00 | 34.5 | | |
| | 5 | 2.00 | 32.5 | | |
| | 6 | 2.00 | 33.0 | 2C | |
| | 7 | 2.00 | 28.0 | | |
| | 8 | 2.00 | 28.5 | | |
| | 3 | 9 | 2.00 | 31.0 | 2M |
| | | 10 | 2.00 | 29.0 | |
| 11 | | 2.00 | 32.0 | 3C | |
| 12 | | 2.00 | 36.5 | | |
| 13 | | 2.00 | 303.0 | | |
| 14 | | 2.00 | 302.5 | 3M | |
| 15 | | 2.00 | 298.0 | | |
| 16 | | 2.00 | 84.5 | | |
| 17 | | 2.00 | 87.5 | 4C | |
| 18 | | 2.00 | 86.5 | | |
| 19 | 2.00 | 854.0 | | | |
| 9 | 20 | 2.00 | 817.5 | 4M | |
| | 21 | 2.00 | 779.5 | | |
| | 22 | 2.00 | 199.5 | | |
| | 23 | 2.00 | 202.5 | 5C | |
| | 24 | 2.00 | 185.5 | | |
| | 25 | 2.00 | 2385.0 | | |
| | 26 | 2.00 | 2517.5 | 5M | |
| | 27 | 2.00 | 2544.5 | | |
| | 28 | 2.00 | 610.0 | | |
| | 29 | 2.00 | 620.5 | | |
| 30 | 2.00 | 585.0 | | | |

| R# | PH | TIME | CPM-1 | CPM-2 |
|--------------------|----|------|--------|---|
| 13 | 1 | 2.00 | 32.0 | 6e 6M 7c |
| | 2 | 2.00 | 31.0 | |
| | 3 | 2.00 | 33.5 | |
| | 4 | 2.00 | 29.5 | |
| | 5 | 2.00 | 28.5 | |
| | 6 | 2.00 | 26.0 | |
| | 7 | 2.00 | 333.5 | |
| | 8 | 2.00 | 333.0 | |
| | 9 | 2.00 | 319.0 | |
| | 10 | 2.00 | 82.0 | |
| *** RACK ERROR *** | | | | |
| 1 | 11 | 2.00 | 86.5 | 7M 8c 8M 9c 9M 10c 10M |
| | 12 | 2.00 | 87.5 | |
| | 13 | 2.00 | 37.0 | |
| | 14 | 2.00 | 37.0 | |
| | 15 | 2.00 | 29.0 | |
| | 16 | 2.00 | 30.5 | |
| | 17 | 2.00 | 31.0 | |
| | 18 | 2.00 | 32.0 | |
| | 19 | 2.00 | 835.5 | |
| | 20 | 2.00 | 862.0 | |
| 15 | 21 | 2.00 | 830.0 | 10c 10M 10c 10M 10c 10M 10c 10M 10c 10M |
| | 22 | 2.00 | 197.5 | |
| | 23 | 2.00 | 178.0 | |
| | 24 | 2.00 | 181.0 | |
| | 25 | 2.00 | 2512.0 | |
| | 26 | 2.00 | 2631.0 | |
| | 27 | 2.00 | 2697.5 | |
| | 28 | 2.00 | 575.5 | |
| | 29 | 2.00 | 590.0 | |
| | 30 | 2.00 | 562.0 | |
| 12 | 31 | 2.00 | 32.5 | After 3 day roll 300hr 1c 2c 3c 4c 5c 6c 7c 8c 9c |
| | 32 | 2.00 | 34.5 | |
| | 33 | 2.00 | 33.5 | |
| | 34 | 2.00 | 36.5 | |
| | 35 | 2.00 | 36.0 | |
| | 36 | 2.00 | 28.5 | |
| | 37 | 2.00 | 557.5 | |
| | 38 | 2.00 | 551.5 | |
| | 39 | 2.00 | 567.5 | |
| | 40 | 2.00 | 1496.0 | |
| 7 | 41 | 2.00 | 1520.0 | 4c 5c 6c 7c 8c 9c 10c 11c 12c 13c |
| | 42 | 2.00 | 1485.0 | |
| | 43 | 2.00 | 3987.0 | |
| | 44 | 2.00 | 4071.0 | |
| | 45 | 2.00 | 4048.5 | |
| | 46 | 2.00 | 36.0 | |
| | 47 | 2.00 | 33.5 | |
| | 48 | 2.00 | 32.0 | |
| | 49 | 2.00 | 585.5 | |
| | 50 | 2.00 | 666.5 | |
| 4 | 51 | 2.00 | 671.5 | 8c 9c 10c 11c 12c 13c 14c 15c 16c 17c |
| | 52 | 2.00 | 29.5 | |
| | 53 | 2.00 | 34.0 | |
| | 54 | 2.00 | 37.0 | |
| | 55 | 2.00 | 1762.5 | |
| | 56 | 2.00 | 1640.0 | |
| | 57 | 2.00 | 1693.5 | |
| | 58 | 2.00 | 4482.5 | |
| | 59 | 2.00 | 4409.0 | |
| | 60 | 2.00 | 4456.5 | |

125 TCM + DMSO
Exp 1

| RE | PH | TIME | CPM-1 | CPM-2 |
|----|----|------|--------|-------|
| 10 | | | | |
| 1 | | 2.00 | 33.5 | 1C |
| 2 | | 2.00 | 35.5 | |
| 3 | | 2.00 | 37.0 | |
| 4 | | 2.00 | 34.5 | 1M |
| 5 | | 2.00 | 32.5 | |
| 6 | | 2.00 | 33.0 | |
| 7 | | 2.00 | 28.0 | 2C |
| 8 | | 2.00 | 28.5 | |
| 9 | | 2.00 | 31.0 | |
| 10 | | 2.00 | 29.0 | 2M |
| 11 | | 2.00 | 32.0 | |
| 12 | | 2.00 | 33.5 | |
| 13 | | 2.00 | 383.0 | 3C |
| 14 | | 2.00 | 382.5 | |
| 15 | | 2.00 | 298.0 | |
| 16 | | 2.00 | 84.5 | 3M |
| 17 | | 2.00 | 87.5 | |
| 18 | | 2.00 | 86.5 | |
| 19 | | 2.00 | 854.0 | 4C |
| 20 | | 2.00 | 817.5 | |
| 21 | | 2.00 | 778.5 | |
| 22 | | 2.00 | 199.5 | 4M |
| 23 | | 2.00 | 202.5 | |
| 24 | | 2.00 | 185.5 | |
| 25 | | 2.00 | 2385.0 | 5C |
| 26 | | 2.00 | 2517.5 | |
| 27 | | 2.00 | 2544.5 | |
| 28 | | 2.00 | 618.0 | 5M |
| 29 | | 2.00 | 628.5 | |
| 30 | | 2.00 | 585.0 | |

..... RESET

***** POWERFAIL RESTART .4 *****
BECKMAN DF5500

***** POWERFAIL RESTART .4 *****
BECKMAN DF5500

..... RESET

MANUAL
ENTER PROG #

| RE | PH | TIME | CPM-1 | CPM-2 |
|----|----|------|-------|-------|
| 1 | | 0.07 | 471.4 | |

..... RESET

MANUAL
ENTER PROG #

| RE | PH | TIME | CPM-1 | CPM-2 |
|----|----|------|-------|-------|
| | | | | |

125 IUdR + DMSO
Exp. 1

| | | | |
|----|------|-------|----|
| 3 | 2.00 | 33.5 | 6M |
| 4 | 2.00 | 29.5 | |
| 5 | 2.00 | 28.5 | |
| 6 | 2.00 | 26.0 | |
| 7 | 2.00 | 333.5 | 7C |
| 8 | 2.00 | 333.0 | |
| 9 | 2.00 | 319.0 | |
| 10 | 2.00 | 82.0 | |

*** RACK ERROR ***

| | | | |
|----|------|-------|----|
| 11 | 2.00 | 86.5 | 7M |
| 12 | 2.00 | 87.5 | |
| 13 | 2.00 | 37.0 | 8C |
| 14 | 2.00 | 39.0 | |
| 15 | 2.00 | 39.0 | |
| 16 | 2.00 | 38.5 | 8M |
| 17 | 2.00 | 31.0 | |
| 18 | 2.00 | 32.0 | 9C |
| 19 | 2.00 | 635.5 | |
| 20 | 2.00 | 642.0 | |

| | | | |
|----|------|--------|------|
| 21 | 2.00 | 630.0 | 9M |
| 22 | 2.00 | 197.5 | |
| 23 | 2.00 | 173.0 | 10AC |
| 24 | 2.00 | 181.0 | |
| 25 | 2.00 | 2512.0 | 10M |
| 26 | 2.00 | 2631.0 | |
| 27 | 2.00 | 2697.5 | |
| 28 | 2.00 | 575.5 | 10M |
| 29 | 2.00 | 590.0 | |
| 30 | 2.00 | 542.0 | |

| | | | |
|----|------|--------|----|
| 31 | 2.00 | 32.5 | 1C |
| 32 | 2.00 | 34.5 | |
| 33 | 2.00 | 33.5 | 2C |
| 34 | 2.00 | 34.5 | |
| 35 | 2.00 | 34.0 | |
| 36 | 2.00 | 30.5 | 3E |
| 37 | 2.00 | 557.5 | |
| 38 | 2.00 | 561.5 | 4C |
| 39 | 2.00 | 547.5 | |
| 40 | 2.00 | 1496.0 | |

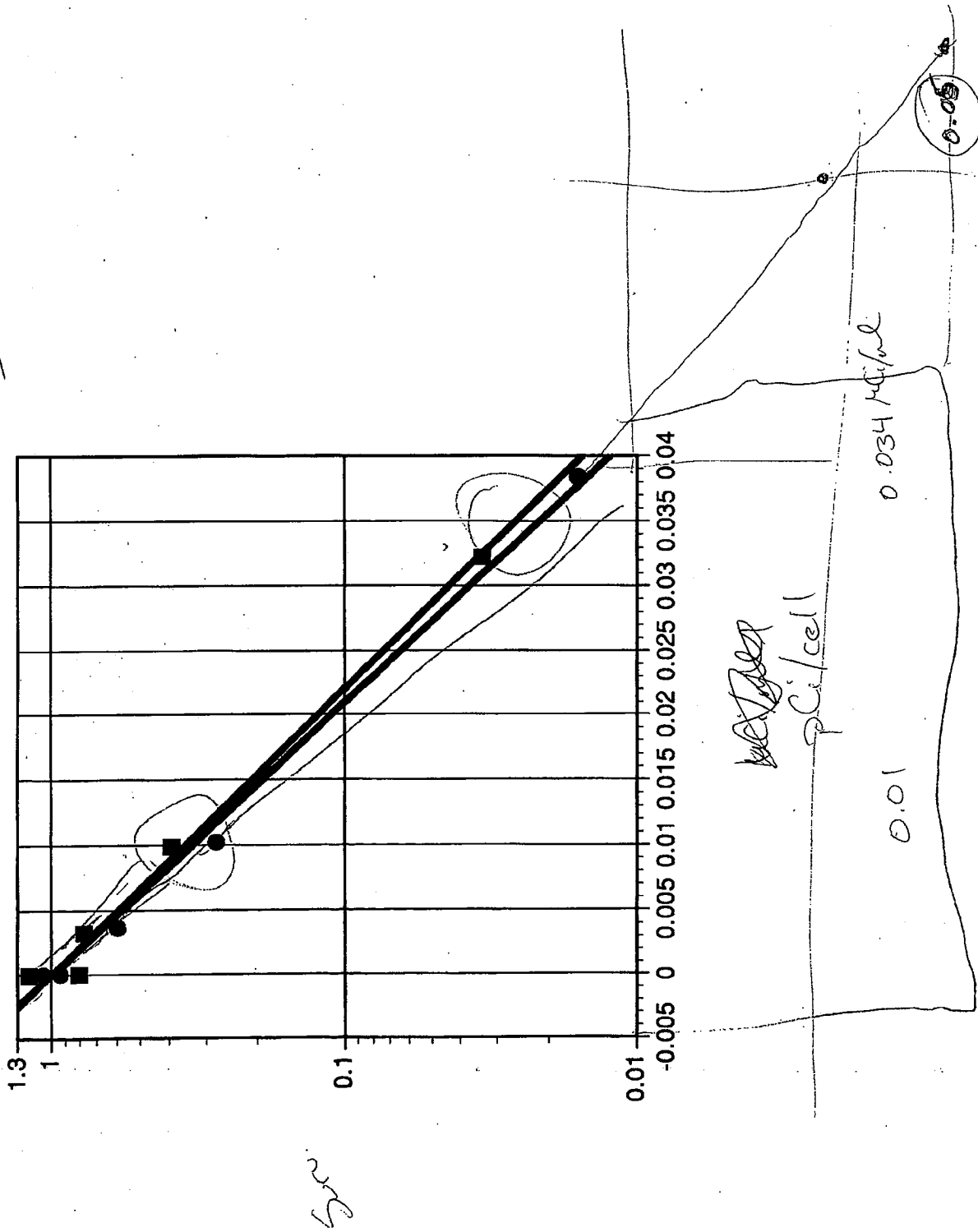
| | | | |
|----|------|--------|----|
| 41 | 2.00 | 1500.0 | 5C |
| 42 | 2.00 | 1405.0 | |
| 43 | 2.00 | 3907.0 | 6C |
| 44 | 2.00 | 4071.0 | |
| 45 | 2.00 | 4048.5 | 7C |
| 46 | 2.00 | 36.0 | |
| 47 | 2.00 | 37.5 | |
| 48 | 2.00 | 32.0 | 8C |
| 49 | 2.00 | 595.5 | |
| 50 | 2.00 | 644.5 | |

| | | | |
|----|------|--------|-----|
| 51 | 2.00 | 674.5 | 9C |
| 52 | 2.00 | 79.5 | |
| 53 | 2.00 | 74.0 | 10C |
| 54 | 2.00 | 37.0 | |
| 55 | 2.00 | 1742.5 | 10E |
| 56 | 2.00 | 1646.0 | |
| 57 | 2.00 | 1693.5 | 10E |
| 58 | 2.00 | 4402.5 | |
| 59 | 2.00 | 4405.0 | |
| 60 | 2.00 | 4456.5 | |

125 IUDR + DMSO Exp 1

| Cells Before | 0.1 | Tube | Coulter Before | Coulter After | uCi/ml | pCi/cell Before | pCi/cell After | Colony | Colony | Colony | Survival Fraction |
|--------------------|---------------|---------------|----------------|---------------|---------------|-----------------|----------------|---------------|---------------|----------------|-------------------|
| Medium (n) | 0.01 | | | | | | | | | | |
| Cells After | 0.3 | 1 | 1294 | 685.3 | -1.01E-04 | 2.02E-05 | -3.98E-07 | 125 | 123 | 126 | 0.8052 |
| Radionuclid -125 | | 2 | 1221 | 930.3 | -6.22E-05 | -5.30E-05 | 5.87E-07 | 189 | 166 | 200 | 1.1948 |
| Efficiency | 0.52 | 3 | 1210 | 931 | 3.10E-03 | 3.26E-03 | 2.77E-03 | 131 | 120 | 108 | 0.7729 |
| Yield | 1.47 | 4 | 1173 | 880 | 9.56E-03 | 9.84E-03 | 8.20E-03 | 62 | 59 | 62 | 0.3940 |
| Backgrd | 33.5556 | 5 | 1119 | 764.5 | 3.37E-02 | 3.22E-02 | 2.55E-02 | 5.3 | 5.4 | 4.9 | 0.0336 |
| | | 6 | 1137 | 953 | -3.27E-04 | 7.92E-06 | 1.43E-06 | 177 | 178 | 194 | 1.0640 |
| | | 7 | 1191 | 1004 | 5.03E-03 | 3.65E-03 | 2.97E-03 | 108 | 108 | 93 | 0.5988 |
| | | 8 | 1223 | 984.5 | -1.41E-04 | 1.74E-05 | -2.77E-07 | 154 | 172 | 157 | 0.9360 |
| | | 9 | 1166 | 1026 | 8.95E-03 | 1.02E-02 | 7.97E-03 | 50 | 49 | 44 | 0.2771 |
| | | 10 | 990 | 763.5 | 3.20E-02 | 3.84E-02 | 2.86E-02 | 2.6 | 3 | 2.6 | 0.0159 |
| | | | | | | | | | | | |
| Tube | Tube 1 | Tube 2 | Tube 3 | Tube 4 | Tube 5 | Tube 6 | Tube 7 | Tube 8 | Tube 9 | Tube 10 | |
| C | 33.5 | 28 | 303 | 854 | 2385 | 33.5 | 333.5 | 37 | 835.5 | 2512 | |
| C | 35.5 | 28.5 | 302.5 | 817.5 | 2517.5 | 35.5 | 333 | 39 | 862 | 2631 | |
| C | 37 | 31 | 298 | 778.5 | 2544.5 | 33.5 | 319 | 29 | 830 | 2698 | |
| M | 34.5 | 29 | 84.5 | 199.5 | 610 | 29.5 | 82 | 30.5 | 197.5 | 575.5 | |
| M | 33 | 32 | 87.5 | 202.5 | 620.5 | 28.5 | 86.5 | 31 | 178 | 590 | |
| M | 28 | 36.5 | 86.5 | 185.5 | 585 | 26 | 87.5 | 32 | 181 | 562 | |
| CC | 32.5 | 36.5 | 557.5 | 1496 | 3907 | 36 | 585.5 | 29.5 | 1763 | 4483 | |
| CC | 34.5 | 36 | 551.5 | 1528 | 4071 | 33.5 | 666.5 | 34 | 1640 | 4489 | |
| CC | 33.5 | 28.5 | 567.5 | 1485 | 4048.5 | 32 | 671.5 | 37 | 1694 | 4457 | |

I-125



- Prepared cells at 400,000 cells/ml in MEMB, 1ml into each tube (MEMB)
- Roll tubes at 3:00pm, for three 1/2 hours at 37°C 5% CO₂
- At 6:00pm, add ingredients (¹²⁵IUDR) as in table ~~(MEMB)~~
- Remove cells from roller on 1/12/96 at 6:00am, spin 2000 rpm 4°C
- Transfer 100µl to separate tube, decant, vortex, add 10ml wash MEMA, centrifuge
- 3x30µl of medium onto tissues
- Wash 3X wash MEMA, resusp in 2µl MEMA with or without 5% DMSO ^{and put on ice}
- Syringe 5X, transfer 0.5 µl to tube, 3x100µl 8 tubes, 1x100µl Carrier
- Place remaining 1.5µl in Shaker at 10.5°C, 150 rpm (8:30am)

Preparation of 0.12 µCi/ml ¹²⁵IUDR from 1µCi/ml ¹²⁵IUDR in H₂O

Take 1µl stock and add to 5µl MEMB

10µl into tubes & count with NaI 2265, 2336 => 0.133 µCi/ml

| | ml MEMB 4x10 ⁵ cells | ml MEMB 0.12 $\frac{\mu\text{Ci}}{\text{ml}}$ | ml MEMB | ml MEMA | ml MEMA + 5% DMSO |
|----|------------------------------------|--|------------|------------|----------------------|
| 1 | 1 | 0 | 1 | 0 | 2 |
| 2 | 1 | 0 | 1 | 0 | 2 |
| 3 | 1 | 0.33 | .67 | 0 | 2 |
| 4 | 1 | 0.67 | .33 | 0 | 2 |
| 5 | 1 | 1 | 0 | 0 | 2 |
| 6 | 1 | 0 | 1 | 2 | 0 |
| 7 | 1 | 0 | 1 | 2 | 0 |
| 8 | 1 | 0.33 | .67 | 2 | 0 |
| 9 | 1 | 0.67 | .33 | 2 | 0 |
| 10 | 1 | 1 | 0 | 2 | 0 |

¹²⁵I-UR2 + DMSO 5% Exp. 2

1/12/96

Counter Counts

| | | |
|----|----------------|-------|
| 1 | 936, 959, 958 | 951 |
| 2 | 1012, 988, 959 | 986.3 |
| 3 | 986, 943, 1019 | 982.7 |
| 4 | 940, 888, 916 | 914.7 |
| 5 | 874, 896, 869 | 879.7 |
| 6 | 901, 894, 899 | 898 |
| 7 | 947, 977, 984 | 969.3 |
| 8 | 876, 868, 893 | 879 |
| 9 | 932, 984, 916 | 944 |
| 10 | 900, 862, 895 | 885.7 |

add 5ml cold wash MEMA 1/15/96

- 9:30 am, remove cells from shaker, spin 2000 rpm, 4°C
- Wash ~~IX~~, resusp. 2 ml with MEMA, syringe
- 100µl Counter, 0.5 µl for dilutions
- 0.33 µl also plated directly into 5.5 & 10.5
- 100µl into 8 tubes

0

| | | |
|----|---------------|-------|
| 1 | 694, 764, 718 | 725.3 |
| 2 | 767, 872, 767 | 802 |
| 3 | 685, 690, 626 | 667 |
| 4 | 682, 667, 596 | 648.3 |
| 5 | 529, 560, 544 | 544.3 |
| 6 | 585, 675, 598 | 619.3 |
| 7 | 676, 674, 709 | 686.3 |
| 8 | 604, 608, 591 | 601 |
| 9 | 641, 638, 603 | 627.3 |
| 10 | 516, 514, 520 | 516.7 |

Colonies:

1.2 94, 84, 79

2.2 86, 66, 84

3.3 26, 27, 42

4.4 51, 53, 53

5.4 20, 18, 12

5.5 37, 57, 56 0.33ml

12.3 19 18.7

6.2 59, 83, 71

7.2 87, 91, 108

8.3 32, 32, 36

9.4 45, 48, 37

10.4 19, 12, 17

10.5 50, 42, 43 0.33ml

16.7 14 14.3

125 ILDR + DMSO 5% Exp. 2

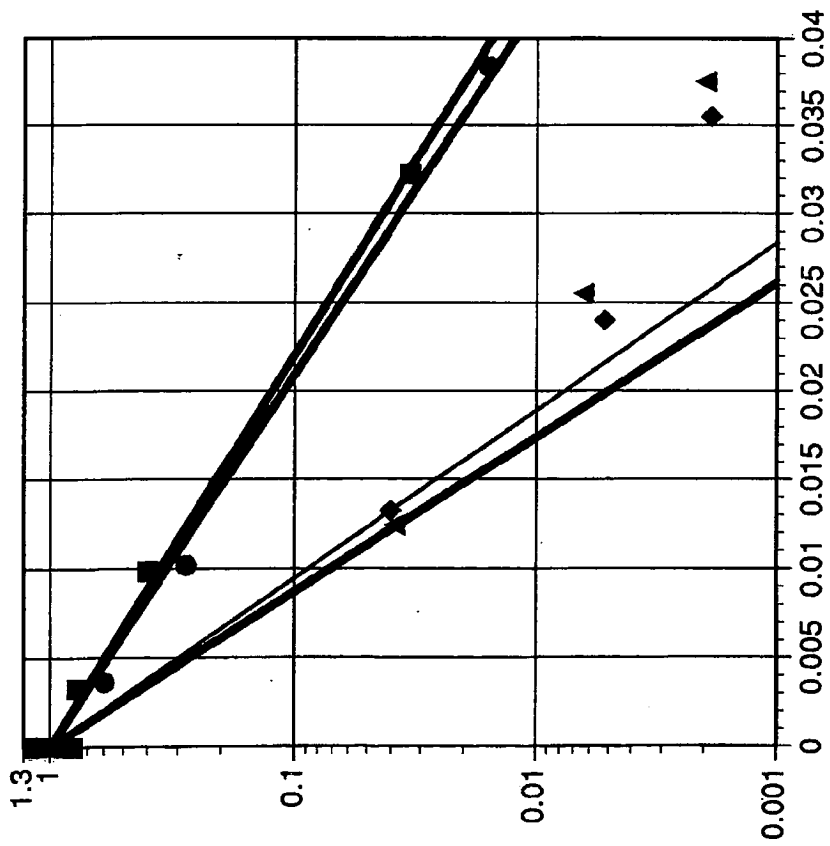
PROGRAM #: 3 01/17/96 17:20
REGION A: LL= 15 UL= 80 BKG= 0 %SIGMA= .00
REGION B: LL= 15 UL= 15 BKG= 0 %SIGMA= .00
ME= 1.00 SCREENING LIMITS= 0 0 K=1.000

| P# | S# | TIME | CPMA/K | CPMB/K | FLAGS | MIN |
|----|----|------|--------|--------|-------|-----|
| 3 | 1 | 1.00 | 28 | 1C | 0 | 1 |
| 3 | 2 | 1.00 | 24 | 1C | 0 | 3 |
| 3 | 3 | 1.00 | 22 | 1C | 0 | 4 |
| 3 | 4 | 1.00 | 17 | 1M | 0 | 5 |
| 3 | 5 | 1.00 | 25 | 1M | 0 | 7 |
| 3 | 6 | 1.00 | 26 | 1M | 0 | 8 |
| 3 | 7 | 1.00 | 26 | 1CC | 0 | 9 |
| 3 | 8 | 1.00 | 18 | 1CC | 0 | 10 |
| 3 | 9 | 1.00 | 29 | 1CC | 0 | 11 |
| 3 | 10 | 1.00 | 31 | 2C | 0 | 12 |
| 3 | 11 | 1.00 | 28 | 2C | 0 | 14 |
| 3 | 12 | 1.00 | 20 | 2C | 0 | 15 |
| 3 | 13 | 1.00 | 30 | 2M | 0 | 16 |
| 3 | 14 | 1.00 | 35 | 2M | 0 | 17 |
| 3 | 15 | 1.00 | 24 | 2M | 0 | 19 |
| 3 | 16 | 1.00 | 23 | 2CC | 0 | 20 |
| 3 | 17 | 1.00 | 21 | 2CC | 0 | 21 |
| 3 | 18 | 1.00 | 17 | 2CC | 0 | 22 |
| 3 | 19 | 1.00 | 1110 | 3C | 0 | 23 |
| 3 | 20 | 1.00 | 1142 | 3C | 0 | 25 |
| 3 | 21 | 1.00 | 1064 | 3C | 0 | 26 |
| 3 | 22 | 1.00 | 829 | 3M | 0 | 27 |
| 3 | 23 | 1.00 | 777 | 3M | 0 | 28 |
| 3 | 24 | 1.00 | 861 | 3M | 0 | 29 |
| 3 | 25 | 1.00 | 674 | 3CC | 0 | 31 |
| 3 | 26 | 1.00 | 670 | 3CC | 0 | 32 |
| 3 | 27 | 1.00 | 646 | 3CC | 0 | 33 |
| 3 | 28 | 1.00 | 2113 | 4C | 0 | 34 |
| 3 | 29 | 1.00 | 2165 | 4C | 0 | 35 |
| 3 | 30 | 1.00 | 2011 | 4C | 0 | 37 |
| 3 | 31 | 1.00 | 1671 | 4M | 0 | 38 |
| 3 | 32 | 1.00 | 1646 | 4M | 0 | 39 |
| 3 | 33 | 1.00 | 1742 | 4M | 0 | 40 |
| 3 | 34 | 1.00 | 1331 | 4CC | 0 | 41 |
| 3 | 35 | 1.00 | 1447 | 4CC | 0 | 43 |
| 3 | 36 | 1.00 | 1330 | 4CC | 0 | 44 |
| 3 | 37 | 1.00 | 2993 | 5C | 0 | 45 |
| 3 | 38 | 1.00 | 3001 | 5C | 0 | 46 |
| 3 | 39 | 1.00 | 2855 | 5C | 0 | 47 |
| 3 | 40 | 1.00 | 2487 | 5M | 0 | 49 |
| 3 | 41 | 1.00 | 2540 | 5M | 0 | 50 |
| 3 | 42 | 1.00 | 2536 | 5M | 0 | 51 |
| 3 | 43 | 1.00 | 1746 | 5CC | 0 | 52 |
| 3 | 44 | 1.00 | 1747 | 5CC | 0 | 53 |
| 3 | 45 | 1.00 | 1787 | 5CC | 0 | 55 |
| 3 | 46 | 1.00 | 32 | 6C | 0 | 56 |
| 3 | 47 | 1.00 | 25 | 6C | 0 | 57 |
| 3 | 48 | 1.00 | 17 | 6C | 0 | 58 |

| P# | S# | TIME | CPMA/K | CPMB/K | FLAGS | MIN |
|----|----|------|--------|--------|-------|-----|
| 3 | 49 | 1.00 | 23 | 6M | 0 | 59 |
| 3 | 50 | 1.00 | 17 | 6M | 0 | 61 |
| 3 | 51 | 1.00 | 20 | 6M | 0 | 62 |
| 3 | 52 | 1.00 | 16 | 6CC | 0 | 63 |
| 3 | 53 | 1.00 | 28 | 6CC | 0 | 64 |
| 3 | 54 | 1.00 | 21 | 6CC | 0 | 65 |
| 3 | 55 | 1.00 | 13 | 7C | 0 | 67 |
| 3 | 56 | 1.00 | 28 | 7C | 0 | 68 |
| 3 | 57 | 1.00 | 33 | 7C | 0 | 69 |
| 3 | 58 | 1.00 | 33 | 7M | 0 | 70 |
| 3 | 59 | 1.00 | 24 | 7M | 0 | 71 |
| 3 | 60 | 1.00 | 32 | 7M | 0 | 73 |
| 3 | 61 | 1.00 | 19 | 7CC | 0 | 74 |
| 3 | 62 | 1.00 | 23 | 7CC | 0 | 75 |
| 3 | 63 | 1.00 | 25 | 7CC | 0 | 76 |
| 3 | 64 | 1.00 | 1119 | 8C | 0 | 77 |
| 3 | 65 | 1.00 | 1100 | 8C | 0 | 79 |
| 3 | 66 | 1.00 | 944 | 8C | 0 | 80 |
| 3 | 67 | 1.00 | 777 | 8M | 0 | 81 |
| 3 | 68 | 1.00 | 803 | 8M | 0 | 82 |
| 3 | 69 | 1.00 | 783 | 8M | 0 | 83 |
| 3 | 70 | 1.00 | 706 | 8CC | 0 | 85 |
| 3 | 71 | 1.00 | 779 | 8CC | 0 | 86 |
| 3 | 72 | 1.00 | 713 | 8CC | 0 | 87 |
| 3 | 73 | 1.00 | 2072 | 9C | 0 | 88 |
| 3 | 74 | 1.00 | 2120 | 9C | 0 | 89 |
| 3 | 75 | 1.00 | 1914 | 9C | 0 | 91 |
| 3 | 76 | 1.00 | 1567 | 9M | 0 | 92 |
| 3 | 77 | 1.00 | 1555 | 9M | 0 | 93 |
| 3 | 78 | 1.00 | 1651 | 9M | 0 | 94 |
| 3 | 79 | 1.00 | 1316 | 9CC | 0 | 95 |
| 3 | 80 | 1.00 | 1344 | 9CC | 0 | 97 |
| 3 | 81 | 1.00 | 1302 | 9CC | 0 | 98 |
| 3 | 82 | 1.00 | 2912 | 10C | 0 | 99 |
| 3 | 83 | 1.00 | 2754 | 10C | 0 | 100 |
| 3 | 84 | 1.00 | 2773 | 10C | 0 | 101 |
| 3 | 85 | 1.00 | 2522 | 10M | 0 | 103 |
| 3 | 86 | 1.00 | 2544 | 10M | 0 | 104 |
| 3 | 87 | 1.00 | 2484 | 10M | 0 | 105 |
| 3 | 88 | 1.00 | 1662 | 10CC | 0 | 106 |
| 3 | 89 | 1.00 | 1931 | 10CC | 0 | 107 |
| 3 | 90 | 1.00 | 1791 | 10CC | 0 | 109 |

~~XXXXXXXXXX~~

| Cells Before Medium (n) | 0.1 0.03 0.1 | Tube | Coulter Before | Coulter After | uCi/ml | pCi/cell Before | pCi/cell After | Colony | Colony | Colony | Survival Fraction |
|-------------------------|--------------------|--------|----------------|---------------|-----------|-----------------|----------------|--------|--------|---------|-------------------|
| Cells After | | 1 | 951 | 725.3 | -2.40E-05 | 1.20E-05 | 9.03E-06 | 94 | 84 | 79 | 1.0426 |
| Radiomucidin-125 | | 2 | 986.3 | 802 | 1.13E-04 | 3.65E-05 | -6.53E-05 | 86 | 66 | 84 | 0.9574 |
| Efficiency | 0.52 | 3 | 982.7 | 667 | 1.57E-02 | 1.62E-02 | 1.41E-02 | 2.6 | 2.7 | 4.2 | 0.0385 |
| Yield | 1.47 | 4 | 914.7 | 648.3 | 3.27E-02 | 3.34E-02 | 3.06E-02 | 0.51 | 0.53 | 0.53 | 0.0064 |
| Backgrd | 23.8889 | 5 | 879.7 | 544.3 | 4.91E-02 | 4.90E-02 | 4.70E-02 | 0.2 | 0.18 | 0.12 | 0.0020 |
| | | 6 | 898 | 619.3 | -7.64E-05 | 1.28E-05 | -5.29E-05 | 59 | 83 | 71 | 0.8537 |
| | | 7 | 969.3 | 686.3 | 1.13E-04 | 1.18E-05 | -3.34E-05 | 87 | 91 | 108 | 1.1463 |
| | | 8 | 879 | 601 | 1.50E-02 | 1.73E-02 | 1.74E-02 | 3.2 | 3.2 | 3.6 | 0.0401 |
| | | 9 | 944 | 627.3 | 3.08E-02 | 3.14E-02 | 3.05E-02 | 0.45 | 0.48 | 0.37 | 0.0052 |
| | | 10 | 885.7 | 516.7 | 4.90E-02 | 4.64E-02 | 5.05E-02 | 0.19 | 0.12 | 0.17 | 0.0019 |
| | | | | | | | | | | | |
| Tube | Tube 1 | Tube 2 | Tube 3 | Tube 4 | Tube 5 | Tube 6 | Tube 7 | Tube 8 | Tube 9 | Tube 10 | |
| C | 28 | 31 | 1110 | 2113 | 2993 | 32 | 13 | 1119 | 2072 | 2912 | |
| C | 24 | 28 | 1142 | 2165 | 3001 | 25 | 28 | 1100 | 2120 | 2754 | |
| C | 22 | 20 | 1064 | 2011 | 2855 | 17 | 33 | 944 | 1914 | 2773 | |
| M | 17 | 30 | 829 | 1671 | 2487 | 23 | 33 | 777 | 1567 | 2522 | |
| M | 25 | 35 | 777 | 1646 | 2540 | 17 | 24 | 803 | 1555 | 2544 | |
| M | 26 | 24 | 861 | 1742 | 2536 | 20 | 32 | 783 | 1651 | 2484 | |
| CC | 26 | 23 | 674 | 1331 | 1746 | 16 | 19 | 706 | 1316 | 1662 | |
| CC | 18 | 21 | 670 | 1447 | 1747 | 28 | 23 | 779 | 1344 | 1931 | |
| CC | 29 | 17 | 646 | 1330 | 1787 | 21 | 25 | 713 | 1302 | 1791 | |



¹²⁵IUDR + DMSO

Exp 3

2/1/96

- Prepared cells @ 400,000 cells/ml in MEMB, 1ml/tube
- Roll tubes @ 2 pm for 4 hrs at 37°C 5% CO₂
- At 6 pm, add ingredients according to table
- Remove cells from roller at 6 am on 2/2/96, spin 4°C, 2000 rpm
- Transfer 100µl supernatant to separate tube, decant, vortex, add 10µl ¹²⁵IUDR with MEMB
- 3 x 30µl super into 8 tubes (M)
- Wash 3X w/ wash MEMB, resusp in 2µl MEMB w/ or w/o DMSO 5% ² put on ice
- Syringe 5X, transfer 0.5µl to 8 tube (3 x 100µl tubes (C), 100µl Cocker)
- Place remaining 1.5µl on roller in rolling @ 49°F.

- Prep of .12 µCi/ml ¹²⁵IUDR from 1 µCi/ml ¹²⁵IUDR in H₂O

Take 1µl stock and add 5µl MEMB

10µl into tube & count in NaI cell, 2009 cpm w 0.12 $\frac{\mu\text{Ci}}{\text{ml}}$

| | ml MEMB 4 x 10 ⁵ cells | ml MEMB 0.12 $\frac{\mu\text{Ci}}{\text{ml}}$ | ml MEMB | ml MEMA | ml MEMA + DMSO 5% |
|----|--------------------------------------|--|------------|------------|-------------------------|
| 1 | 1 | 0 | 1 | 0 | 2 |
| 2 | 1 | 0 | 1 | 0 | 2 |
| 3 | 1 | .33 | 0.67 | 0 | 2 |
| 4 | 1 | .67 | 0.33 | 0 | 2 |
| 5 | 1 | 1 | 0 | 0 | 2 |
| 6 | 1 | 0 | 1 | 2 | 0 |
| 7 | 1 | 0 | 1 | 2 | 0 |
| 8 | 1 | .33 | .67 | 2 | 0 |
| 9 | 1 | .67 | .33 | 2 | 0 |
| 10 | 1 | 1 | 0 | 2 | 0 |

Counter Counts Before Roll

| | | |
|-----|---------------|-------|
| 1) | 684, 600, 641 | 641.6 |
| 2) | 570, 665, 613 | 616 |
| 3) | 602, 631, 565 | 599 |
| 4) | 555, 515, 602 | 557 |
| 5) | 487, 571, 521 | 526.3 |
| 6) | 581, 503, 550 | 544.7 |
| 7) | 604, 536, 611 | 583.7 |
| 8) | 537, 497, 491 | 508.3 |
| 9) | 532, 578, 491 | 533.7 |
| 10) | 499, 498, 466 | 487.7 |

Counter Counts After Roll

| | | |
|-----|---------------|-------|
| 1) | 516, 469, 504 | 496.3 |
| 2) | 502, 459, 504 | 488.3 |
| 3) | 425, 381, 404 | 403.3 |
| 4) | 351, 393, 367 | 370.3 |
| 5) | 364, 349, 376 | 363 |
| 6) | 402, 402, 400 | 401.3 |
| 7) | 459, 450, 392 | 433.7 |
| 8) | 354, 413, 392 | 413 |
| 9) | 424, 371, 407 | 400.7 |
| 10) | 370, 388, 343 | 367 |

Exp. 3 ¹²⁵IUDR + 5% DMSO

2/12/96

Colonies

1.2 44, 57, 54

2.2 48, 49, 50

3.3 9, 12, 7

4.4 17, 25, 20

5.4 7, 6, 6

6.2 ~~65, 61, 67~~ no colonies (3, 2, 2)

7.2 65, 61, 67

8.3 5, 8, 3

9.4 13, 8, 9

10.4 2, 4, 1

125 IUAR + 570 DMSO

Exp. 3

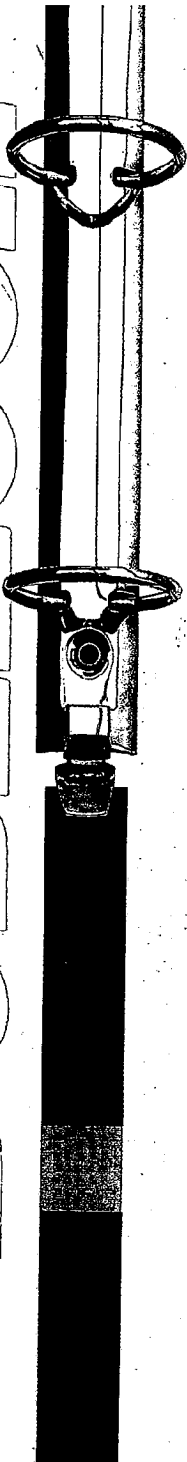
PROGRAM #: 3
REGION A: LL= 15 UL= 80 BKG= 0 %SIGMA= .00
REGION B: LL= 15 UL= 15 BKG= 0 %SIGMA= .00
TIME= 1.00 SCREENING LIMITS= 0 0 K=1.000
02/09/96 12:47

| P# | S# | TIME | CPMA/K | CPMB/K | FLAGS | MIN |
|----|----|------|--------|--------|-------|-----|
| 3 | 1 | 1.00 | 30 | 0 | | 1 |
| 3 | 2 | 1.00 | 20 | 0 | 1M | 2 |
| 3 | 3 | 1.00 | 28 | 0 | | 3 |
| 3 | 4 | 1.00 | 20 | 0 | | 5 |
| 3 | 5 | 1.00 | 18 | 0 | 1C | 6 |
| 3 | 6 | 1.00 | 23 | 0 | | 7 |
| 3 | 7 | 1.00 | 30 | 0 | | 8 |
| 3 | 8 | 1.00 | 20 | 0 | 1CC | 9 |
| 3 | 9 | 1.00 | 17 | 0 | | 11 |
| 3 | 10 | 1.00 | 28 | 0 | | 12 |
| 3 | 11 | 1.00 | 23 | 0 | 2M | 13 |
| 3 | 12 | 1.00 | 22 | 0 | | 14 |
| 3 | 13 | 1.00 | 26 | 0 | | 15 |
| 3 | 14 | 1.00 | 29 | 0 | 2C | 17 |
| 3 | 15 | 1.00 | 17 | 0 | | 18 |
| 3 | 16 | 1.00 | 32 | 0 | | 19 |
| 3 | 17 | 1.00 | 26 | 0 | 2CC | 20 |
| 3 | 18 | 1.00 | 33 | 0 | | 21 |
| 3 | 19 | 1.00 | 704 | 0 | | 23 |
| 3 | 20 | 1.00 | 768 | 0 | 3M | 24 |
| 3 | 21 | 1.00 | 751 | 0 | | 25 |
| 3 | 22 | 1.00 | 535 | 0 | | 26 |
| 3 | 23 | 1.00 | 553 | 0 | 3C | 27 |
| 3 | 24 | 1.00 | 609 | 0 | | 29 |
| 3 | 25 | 1.00 | 312 | 0 | | 30 |
| 3 | 26 | 1.00 | 331 | 0 | 3CC | 31 |
| 3 | 27 | 1.00 | 291 | 0 | | 32 |
| 3 | 28 | 1.00 | 1552 | 0 | | 33 |
| 3 | 29 | 1.00 | 1527 | 0 | 4M | 35 |
| 3 | 30 | 1.00 | 1555 | 0 | | 36 |
| 3 | 31 | 1.00 | 1030 | 0 | | 37 |
| 3 | 32 | 1.00 | 1029 | 0 | 4C | 38 |
| 3 | 33 | 1.00 | 931 | 0 | | 39 |
| 3 | 34 | 1.00 | 530 | 0 | 4CC | 41 |
| 3 | 35 | 1.00 | 563 | 0 | | 42 |
| 3 | 36 | 1.00 | 552 | 0 | | 43 |
| 3 | 37 | 1.00 | 2351 | 0 | | 44 |
| 3 | 38 | 1.00 | 2308 | 0 | 5M | 46 |
| 3 | 39 | 1.00 | 2258 | 0 | | 47 |
| 3 | 40 | 1.00 | 1608 | 0 | | 48 |
| 3 | 41 | 1.00 | 1715 | 0 | 5C | 49 |
| 3 | 42 | 1.00 | 1526 | 0 | | 50 |
| 3 | 43 | 1.00 | 911 | 0 | | 51 |
| 3 | 44 | 1.00 | 883 | 0 | 5CC | 53 |
| 3 | 45 | 1.00 | 881 | 0 | | 54 |
| 3 | 46 | 1.00 | 22 | 0 | | 55 |
| 3 | 47 | 1.00 | 26 | 0 | 6M | 56 |

| F# | S# | TIME | CPMA/K | CPMB/K | FLAGS | MIN |
|----|----|------|--------|--------|-------|-----|
| 3 | 49 | 1.00 | 28 | | 0 | 59 |
| 3 | 50 | 1.00 | 26 | } 6C | 0 | 60 |
| 3 | 51 | 1.00 | 29 | | 0 | 61 |
| 3 | 52 | 1.00 | 22 | } 6CC | 0 | 62 |
| 3 | 53 | 1.00 | 18 | | 0 | 64 |
| 3 | 54 | 1.00 | 26 | | 0 | 65 |
| 3 | 55 | 1.00 | 27 | } 7M | 0 | 66 |
| 3 | 56 | 1.00 | 17 | | 0 | 67 |
| 3 | 57 | 1.00 | 27 | | 0 | 68 |
| 3 | 58 | 1.00 | 22 | } 7C | 0 | 70 |
| 3 | 59 | 1.00 | 18 | | 0 | 71 |
| 3 | 60 | 1.00 | 21 | | 0 | 72 |
| 3 | 61 | 1.00 | 31 | } 7CC | 0 | 73 |
| 3 | 62 | 1.00 | 26 | | 0 | 74 |
| 3 | 63 | 1.00 | 29 | | 0 | 76 |
| 3 | 64 | 1.00 | 802 | | 0 | 77 |
| 3 | 65 | 1.00 | 778 | } 8M | 0 | 78 |
| 3 | 66 | 1.00 | 751 | | 0 | 79 |
| 3 | 67 | 1.00 | 619 | } 8C | 0 | 80 |
| 3 | 68 | 1.00 | 565 | | 0 | 82 |
| 3 | 69 | 1.00 | 523 | | 0 | 83 |
| 3 | 70 | 1.00 | 363 | } 8CC | 0 | 84 |
| 3 | 71 | 1.00 | 368 | | 0 | 85 |
| 3 | 72 | 1.00 | 350 | | 0 | 86 |
| 3 | 73 | 1.00 | 1558 | } 9M | 0 | 88 |
| 3 | 74 | 1.00 | 1607 | | 0 | 89 |
| 3 | 75 | 1.00 | 1574 | | 0 | 90 |
| 3 | 76 | 1.00 | 1127 | } 9C | 0 | 91 |
| 3 | 77 | 1.00 | 1138 | | 0 | 92 |
| 3 | 78 | 1.00 | 1277 | | 0 | 94 |
| 3 | 79 | 1.00 | 547 | } 9CC | 0 | 95 |
| 3 | 80 | 1.00 | 788 | | 0 | 96 |
| 3 | 81 | 1.00 | 633 | | 0 | 97 |
| 3 | 82 | 1.00 | 2357 | | 0 | 98 |
| 3 | 83 | 1.00 | 2373 | } 10M | 0 | 100 |
| 3 | 84 | 1.00 | 2427 | | 0 | 101 |
| 3 | 85 | 1.00 | 1559 | } 10C | 0 | 102 |
| 3 | 86 | 1.00 | 1503 | | 0 | 103 |
| 3 | 87 | 1.00 | 1578 | | 0 | 104 |
| 3 | 88 | 1.00 | 914 | } 10CC | 0 | 106 |
| 3 | 89 | 1.00 | 942 | | 0 | 107 |
| 3 | 90 | 1.00 | 825 | | 0 | 108 |

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364 Line



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Locking Rings!
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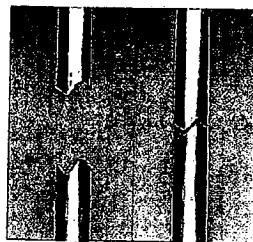
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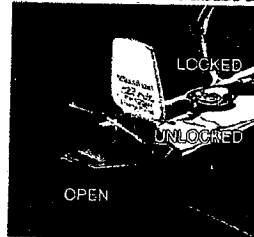
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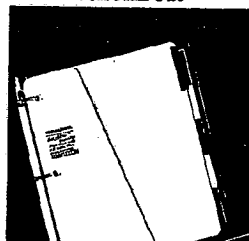
**The
WilsonJones®
Difference**



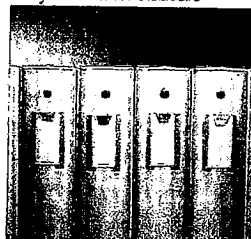
Cure GAPITIS! DubbllLock



Sheets won't fall out



EasyFlow Sheet Lifters



Identify and organize

P-32 + DMSD

Color coding made easy! Type or write in titles.
Tear along perforations and insert into label holders.

50°F 10°C

DMSO Toxicity at 4°C : Test Experiment.

Procedure: ① Split the cells and count

② Transfer 4×10^5 ~~2 million~~ cells to each tube and add different concentrations of DMSO (5%, 10% & 20%)

③ Roll the cells on roller for 3 days at 4°C.

④ Take the cells out, wash them and plate them for colony formation.

| Tube # | Type | Cell suspension (200 cells) | DMSO (ml) | MEM-A ± 10% FCS | FCS |
|--------|----------------------|--------------------------------|--------------|--------------------|-----|
| 1 | Control | 1.0 | 0 | 1.0 | 0 |
| 2 | " | 1.0 | 0 | 1.0 | 0 |
| 3 | 5% DMSO | 1.0 | 0.1 | 0.9 | 0 |
| 4 | 10% DMSO | 1.0 | 0.2 | 0.8 | 0 |
| 5 | 20% DMSO | 1.0 | 0.4 | 0.6 | 0 |
| 6 | 5% DMSO + 20% Serum | 1.0 | 0.1 | 0.6 | 0.3 |
| 7 | 10% DMSO + 20% Serum | 1.0 | 0.2 | 0.5 | 0.3 |

| Type | # Colonies | Avg | SF |
|-------------------------------------|---------------|-----|------|
| ① Control | 121, 137, 133 | 126 | 1.0 |
| ② Control | 121, 125, 117 | | |
| ③ 5% DMSO | 128, 127, 111 | 122 | 0.97 |
| ④ 10% DMSO | 45, 54, 60 | 53 | 0.42 |
| ⑤ 20% DMSO | 0, 0, 0 | 0 | |
| ⑥ 5% DMSO, 20% Serum FCS | 144, 146, 154 | 148 | 1.18 |
| ⑦ 10% DMSO, 20% FCS | 60, 46, 43 | 50 | 0.40 |

2/13/75

8

Test Experiment: Survival of V79 cells at 4°C ~~and~~ ^{50°F} for different times

Procedure: - ~~1)~~ 1) Split the cells

2) Counted the cells

3) Plated the cells in culture flasks, ^{such that} 200 cells/flask

4) Kept the flasks (cap loose) in the incubator for 1h at 37°C of 5% CO_2 & 95% Air.

5) Tighten the caps and move the flasks to refrigerator at 4°C .

6) At different times ^{move} ~~the~~ ~~out~~ the flasks back to incubator.

7) Stain the cells ^{on} ~~at~~ T_n day from the day the flasks are back to the incubator.

8) Count the cells.

| Time (h) | # of cells | Ave | ^{Final Error} Error | SR |
|----------|---------------|----------------|---------------------------------|------------------|
| Controls | 148, 179, 143 | 157 ± 16 | (.102) | 1.0 |
| 16.5 | 149, 163, 136 | 149 ± 11 | (.074) | 0.949 ± 0.12 |
| 24.5 | 162, 173, 149 | 161 ± 9.8 | (.061) | 1.03 ± 0.12 |
| 41.0 | 159, 124, 146 | 143 ± 14 | (.098) | 0.911 |
| 48.5 | 146, 155, 165 | 155 ± 7.8 | (.050) | 0.987 |
| 65.0 | 153, 142, 164 | 153 ± 9 | (.055) | 0.975 |
| 72.0 | 133, 154, 159 | 149 ± 11.3 | (.074) | 0.949 |

2/27/95

Test Experiment ^{V79 cell} ~~DMSO~~ Survival at 4°C in presence of ~~of~~
different concentrations of DMSO.

Procedure:

- ① Split the cells and count.
- ② Plate 200 cells in each culture flask containing different concentrations of DMSO.
- ③ Keep the flasks (cap closed) in Refrigerator at 4°C for one week.
- ④ Keep one set of flasks with no DMSO in incubator at 37°C, 5% CO₂.
- ⑤ Keep one set of flasks with " " " Refrigerator at 4°C.
- ⑥ on 7th day ~~wash~~ wash DMSO ~~with~~ with wash medium 3 times and move the flasks to incubator. Also wash the control group cells kept at 4°C and move them into incubator.
- ⑦ ~~Stain the control group of flasks~~ Stain the cells ~~at~~ on 7th day from the day the flasks are back to the incubator.
- ⑧ Count the colonies.

Experiment 1
P32 + DMSO 5% : V79 Cells

4/4/95

Purpose: To determine whether 5% DMSO can protect against irradiation of V79 cells by P-32.

Materials: MEM with 10% FCS, L-glut, pen-strep

DMSO from Sigma

P-32 as orthophosphoric acid (H_3O_4P) 1mCi/ml
 (NEN cat # NEX-053) (Lot # 03954W)

- Methods:
- Prepared MEMA with 10% DMSO - 9.9 ml MEMA + 1.1 ml DMSO
 - Prepared cells at 4×10^5 cells/ml via trypsinization followed by dilution
 - Placed cells (1 ml per tube) on ice along with MEMA + DMSO tube
 - Let cool for 2 h
 - Add ingredients to tubes as per instructions below in Table
 - Place on rocker-roller in refrigerator at 41° F (12:00 noon)
 - After 3 days, (at 12:00 noon) remove from refrigerator
 - Take 400µl aliquots from each tube
 - Process ~~the~~ aliquots 5 of 10 for cellular uptake using microtiter assay. 50µl x 3 onto calf serum
 - Add 9 ml wash MEMA to each tube, vortex, centrif, decant
 - Wash 3 more times ~~MEMA~~

Actual µl added



1.47 µCi/hr on 4/5/95

| | ml MEMA w/ 4×10^5 cells/ml | MEMA w/ 10% DMSO (ml) | MEMA (ml) | µCi P-32 | Approx. Dose (rad) | Dilutions to Plate | Surv. | Actual µl added ↓ 1.47 µCi/hr on 4/5/95 µl P-32 added |
|----|-------------------------------------|-----------------------|-----------|----------|--------------------|--------------------|-------|--|
| 1 | 1 | 1 | 0 | 0 | 0 | 10^2 | - | 0 |
| 2 | 1 | 1 | 0 | 9.4 | 400 | 10^2 | .58 | 6.39 µl |
| 3 | 1 | 1 | 0 | 18.8 | 800 | $10^2, 10^3$ | .175 | 12.78 |
| 4 | 1 | 1 | 0 | 28.2 | 1200 | $10^2, 10^3$ | .086 | 19.17 |
| 5 | 1 | 1 | 0 | 37.6 | 1600 | $10^3, 10^4$ | .046 | 25.56 |
| 6 | 1 | 0 | 1 | 0 | 0 | 10^2 | - | 0 |
| 7 | 1 | 0 | 1 | 9.4 | 800 | 10^2 | .48 | 6.39 |
| 8 | 1 | 0 | 1 | 18.8 | 800 | $10^2, 10^3$ | .061 | 12.78 |
| 9 | 1 | 0 | 1 | 28.2 | 1200 | $10^2, 10^3$ | .015 | 19.17 |
| 10 | 1 | 0 | 1 | 37.6 | 1600 | $10^3, 10^4$ | 0 | 25.56 |

Exp. 1 contd.

4/4/95

- Resuspend in 2 ml wash MEMA
- Syringe, coulter count, dilute 3×10^4 and plate into flasks
100 μ l in 20ml
- Take 2 x 100 μ l of cell suspension for activity determination

| | cell counts | cells per 100 μ l |
|----|--------------------|-----------------------|
| 1 | 334, 327 | 13,200 |
| 2 | 294, 300 | 13,800 |
| 3 | 342, 347 | 13,800 |
| 4 | 347, 368 | 14,300 |
| 5 | 368, 401, 358, 417 | 15,400 |
| 6 | 396, 370 | 15,300 |
| 7 | 323, 325 | 13,000 |
| 8 | 314, 297 | 12,200 |
| 9 | 368, 361 | 14,600 |
| 10 | 352, 362 | 14,300 |

Liquid Scintillation Count - Before washing cells

4/7/95

USER: 4 ID:WIPE PRESET TIME: 1.00 FRI 07 APR 1995 12:39
 SAMPLE REPEAT: 1 CYCLE REPEAT: 1 SCR:N RS232:N
 H#: 1 AGC:N GCF:N RCM:N
 CHANNEL 1-LL: 0 UL: 400 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 CHANNEL 2-LL: 0 UL: 670 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 CHANNEL 3-LL: 0 UL: 1000 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 DATA CALC: CPM, UNKNOWN REPLICATES: 1 NORM FACTOR: 1.00000
 HALF LIFE (DAYS): N

| SAM | POS | CH | CPM | 2SIG% | TIME | EL TIME | AVG H# | ERR |
|-----|-------|----|---------|-------|------|---------|--------|-----|
| 1 | 28-1 | 1 | 1941.00 | 4.54 | 1.00 | 1.41 | 87.0 | |
| | | 2 | 5326.00 | 2.74 | | | | |
| | | 3 | 8447.00 | 2.18 | | | | |
| 2 | 28-2 | 1 | 2323.00 | 4.15 | 1.00 | 2.97 | 84.0 | |
| | | 2 | 5876.00 | 2.61 | | | | |
| | | 3 | 9647.00 | 2.04 | | | | |
| 3 | 28-3 | 1 | 1293.00 | 5.56 | 1.00 | 4.53 | 88.0 | |
| | | 2 | 4182.00 | 3.09 | | | | |
| | | 3 | 9252.00 | 2.08 | | | | |
| 4 | 28-4 | 1 | 872.00 | 6.77 | 1.00 | 6.09 | 88.0 | |
| | | 2 | 2606.00 | 3.92 | | | | |
| | | 3 | 5220.00 | 2.77 | | | | |
| 5 | 28-5 | 1 | 1281.00 | 5.59 | 1.00 | 7.65 | 88.0 | |
| | | 2 | 3527.00 | 3.37 | | | | |
| | | 3 | 6700.00 | 2.44 | | | | |
| 6 | 28-6 | 1 | 597.00 | 8.19 | 1.00 | 9.21 | 91.0 | |
| | | 2 | 3134.00 | 3.57 | | | | |
| | | 3 | 9597.00 | 2.04 | | | | |
| 8 | 28-8 | 1 | 307.00 | 11.41 | 1.00 | 10.78 | 88.0 | |
| | | 2 | 1218.00 | 5.73 | | | | |
| | | 3 | 3010.00 | 3.65 | | | | |
| 9 | 28-9 | 1 | 98.00 | 20.20 | 1.00 | 12.33 | 91.0 | |
| | | 2 | 786.00 | 7.13 | | | | |
| | | 3 | 2777.00 | 3.80 | | | | |
| 10 | 28-10 | 1 | 219.00 | 13.51 | 1.00 | 13.89 | 92.0 | |
| | | 2 | 1215.00 | 5.74 | | | | |
| | | 3 | 3533.00 | 3.36 | | | | |
| 11 | 28-11 | 1 | 584.00 | 8.28 | 1.00 | 15.45 | 86.0 | |
| | | 2 | 1293.00 | 5.56 | | | | |
| | | 3 | 1912.00 | 4.57 | | | | |
| 12 | 28-12 | 1 | 350.00 | 10.69 | 1.00 | 17.00 | 89.0 | |
| | | 2 | 1237.00 | 5.69 | | | | |
| | | 3 | 2515.00 | 3.99 | | | | |
| 13 | 28-13 | 1 | 72.00 | 23.57 | 1.00 | 18.56 | 92.0 | |
| | | 2 | 643.00 | 7.89 | | | | |
| | | 3 | 2421.00 | 4.06 | | | | |

5ml Escort

5 Cells

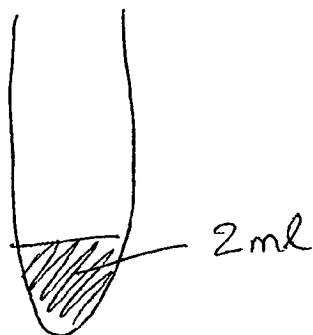
5 Supernatant

10C

10S

Layered 50µl on top of 300µl half serum cells

32 P



$$\Delta =$$

$$\frac{\pi}{6} d^3 = 2$$

$$d^3 = \frac{12}{\pi}$$

$$d = 1.56 \text{ cm}$$

From donut code.

$$S = 0.59 \frac{\text{rad}}{\mu\text{Ci} \cdot \text{hr}}$$

Deliver dose over three days.

$$T = 72 \text{ h}$$

Deliver doses up to 1500 rad.

$$D = ST = 42.5 \frac{\text{rad}}{\mu\text{Ci}}$$

Top dose is 35 μCi

| (rad) Dose | μCi |
|---------------|----------------|
| 0 | 0 |
| 200 | 4.7 |
| 400 | 9.4 |
| 600 | 14.1 |
| 800 | 18.8 |
| 1000 | 23.5 |
| 1200 | 28.2 |
| 1400 | 32.9 |
| 1600 | 37.6 |

Total 169.2 μCi

N228732

PB10202

 α -P32 CTp10 $\mu\text{Ci}/\text{ml}$ Amersham.
Cytosine triphosphate
250 μCi

Cellular Dosimetry
P-32

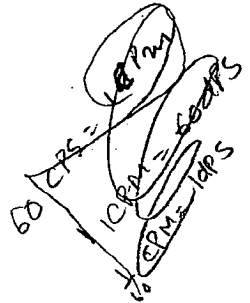
4/7/95

eff = 1
yield = 1

140,000 cells/ml

~~60 cpm~~

1.44 · 12



72 h (3600)

$$\frac{2300 \text{ cpm}}{15000 \text{ cells}} \cdot \frac{\text{dps}}{\text{cpm}} = \frac{38.3 \text{ Bq}}{\text{cell}}$$

$$= 0.0026 \frac{\text{Bq}}{\text{cell}}$$

$$\checkmark \bar{A} = 0.0026 \frac{\text{Bq}}{\text{cell}} \left(72(3600) + 1.44(12)(3600) \right) = 321408 \times 0.0026$$

$$= 836 \frac{\text{Bq} \cdot \text{s}}{\text{cell}} \left(3.86 \times 10^{-4} \frac{\text{Gy}}{\text{Bq} \cdot \text{s}} \right)$$

$$= 0.32 \text{ Gy from cellular uptake.}$$

About 16 Gy from extracellular activity

$$\frac{0.0026 \frac{\text{Bq}}{\text{cell}}}{\frac{\pi}{6} (10 \times 10^{-4})^3} = 0.0026 \left(\frac{6}{\pi} \right) \times 10^9 \frac{\text{Bq}}{\text{ml}} = 5 \frac{\text{MBq}}{\text{ml}} \text{ in the cell}$$

USER: 4 ID:WIPE

PRESET TIME: 1.00

FRI 07 APR 1995 14:43

SAMPLE REPEAT: 1 CYCLE REPEAT: 1 SCR:N RS232:N

H#: 1 AQC:N QCF:N RCM:N

CHANNEL 1-LL: 0 UL: 400 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0

CHANNEL 2-LL: 0 UL: 670 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0

CHANNEL 3-LL: 0 UL:1000 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0

DATA CALC: CPM, UNKNOWN REPLICATES: 1 NORM FACTOR: 0 1.00000

HALF LIFE(DAYS):N

| SAM | POS | CH | CPM | 2SIGZ | TIME | EL TIME | AVG H# | ERR |
|-----|--------|----|---------|-------|------|---------|--------|-----|
| 1 | 1 **- | 1 | 14.00 | 53.45 | 1.00 | 1.41 | 91.0 | |
| | | 2 | 23.00 | 41.70 | | | | |
| | | 3 | 26.00 | 39.22 | | | | |
| 1 | 2 **- | 1 | 12.00 | 57.74 | 1.00 | 2.97 | 102.0 | |
| | | 2 | 20.00 | 44.72 | | | | |
| | | 3 | 27.00 | 38.49 | | | | |
| 2 | 3 **- | 1 | 32.00 | 35.36 | 1.00 | 4.53 | 103.0 | |
| | | 2 | 207.00 | 13.90 | | | | |
| | | 3 | 674.00 | 7.70 | | | | |
| 2 | 4 **- | 1 | 55.00 | 26.97 | 1.00 | 6.08 | 104.0 | |
| | | 2 | 254.00 | 12.55 | | | | |
| | | 3 | 730.00 | 7.40 | | | | |
| 3 | 5 **- | 1 | 62.00 | 25.40 | 1.00 | 7.64 | 104.0 | |
| | | 2 | 364.00 | 10.48 | | | | |
| | | 3 | 1075.00 | 6.10 | | | | |
| 3 | 6 **- | 1 | 65.00 | 24.81 | 1.00 | 9.20 | 104.0 | |
| | | 2 | 351.00 | 10.68 | | | | |
| | | 3 | 1035.00 | 6.22 | | | | |
| 4 | 7 **- | 1 | 199.00 | 14.18 | 1.00 | 10.75 | 100.0 | |
| | | 2 | 642.00 | 7.89 | | | | |
| | | 3 | 1405.00 | 5.34 | | | | |
| 4 | 8 **- | 1 | 77.00 | 22.79 | 1.00 | 12.31 | 103.0 | |
| | | 2 | 468.00 | 9.25 | | | | |
| | | 3 | 1527.00 | 5.12 | | | | |
| 5 | 9 **- | 1 | 125.00 | 17.89 | 1.00 | 13.87 | 104.0 | |
| | | 2 | 730.00 | 7.40 | | | | |
| | | 3 | 2286.00 | 4.18 | | | | |
| 5 | 10 **- | 1 | 126.00 | 17.82 | 1.00 | 15.42 | 104.0 | |
| | | 2 | 717.00 | 7.47 | | | | |
| | | 3 | 2311.00 | 4.16 | | | | |
| 6 | 11 **- | 1 | 14.00 | 53.45 | 1.00 | 16.98 | 97.0 | |
| | | 2 | 18.00 | 47.14 | | | | |
| | | 3 | 22.00 | 42.64 | | | | |
| 6 | 12 **- | 1 | 8.00 | 70.71 | 1.00 | 18.53 | 104.0 | |
| | | 2 | 14.00 | 53.45 | | | | |
| | | 3 | 27.00 | 38.49 | | | | |
| 7 | 13 **- | 1 | 25.00 | 40.00 | 1.00 | 20.09 | 103.0 | |
| | | 2 | 75.00 | 23.09 | | | | |
| | | 3 | 197.00 | 14.25 | | | | |
| 7 | 14 **- | 1 | 21.00 | 43.64 | 1.00 | 21.63 | 103.0 | |
| | | 2 | 68.00 | 24.25 | | | | |
| | | 3 | 191.00 | 14.47 | | | | |

P-32 Uptake following 4X wash

| SAM | POS | CH | CPM | 2SIG% | TIME | EL TIME | AVG H# | ERR | |
|-----|-----|----|-----|--------|-------|---------|--------|-------|-------|
| 8 | 15 | ** | 15 | 1 | 32.00 | 35.36 | 1.00 | 23.18 | 104.0 |
| | | | 2 | 123.00 | 18.03 | | | | |
| | | | 3 | 346.00 | 10.75 | | | | |
| 8 | 16 | ** | 16 | 1 | 20.00 | 44.72 | 1.00 | 24.74 | 102.0 |
| | | | 2 | 84.00 | 21.82 | | | | |
| | | | 3 | 291.00 | 11.72 | | | | |
| 9 | 17 | ** | 17 | 1 | 28.00 | 37.80 | 1.00 | 26.30 | 104.0 |
| | | | 2 | 131.00 | 17.47 | | | | |
| | | | 3 | 455.00 | 9.38 | | | | |
| 9 | 18 | ** | 18 | 1 | 26.00 | 39.22 | 1.00 | 27.84 | 103.0 |
| | | | 2 | 127.00 | 17.75 | | | | |
| | | | 3 | 442.00 | 9.51 | | | | |
| 10 | 19 | ** | 19 | 1 | 47.00 | 29.17 | 1.00 | 29.45 | 104.0 |
| | | | 2 | 243.00 | 12.83 | | | | |
| | | | 3 | 800.00 | 7.07 | | | | |
| 10 | 20 | ** | 20 | 1 | 73.00 | 23.41 | 1.00 | 31.00 | 103.0 |
| | | | 2 | 304.00 | 11.47 | | | | |
| | | | 3 | 880.00 | 6.74 | | | | |

Colonies

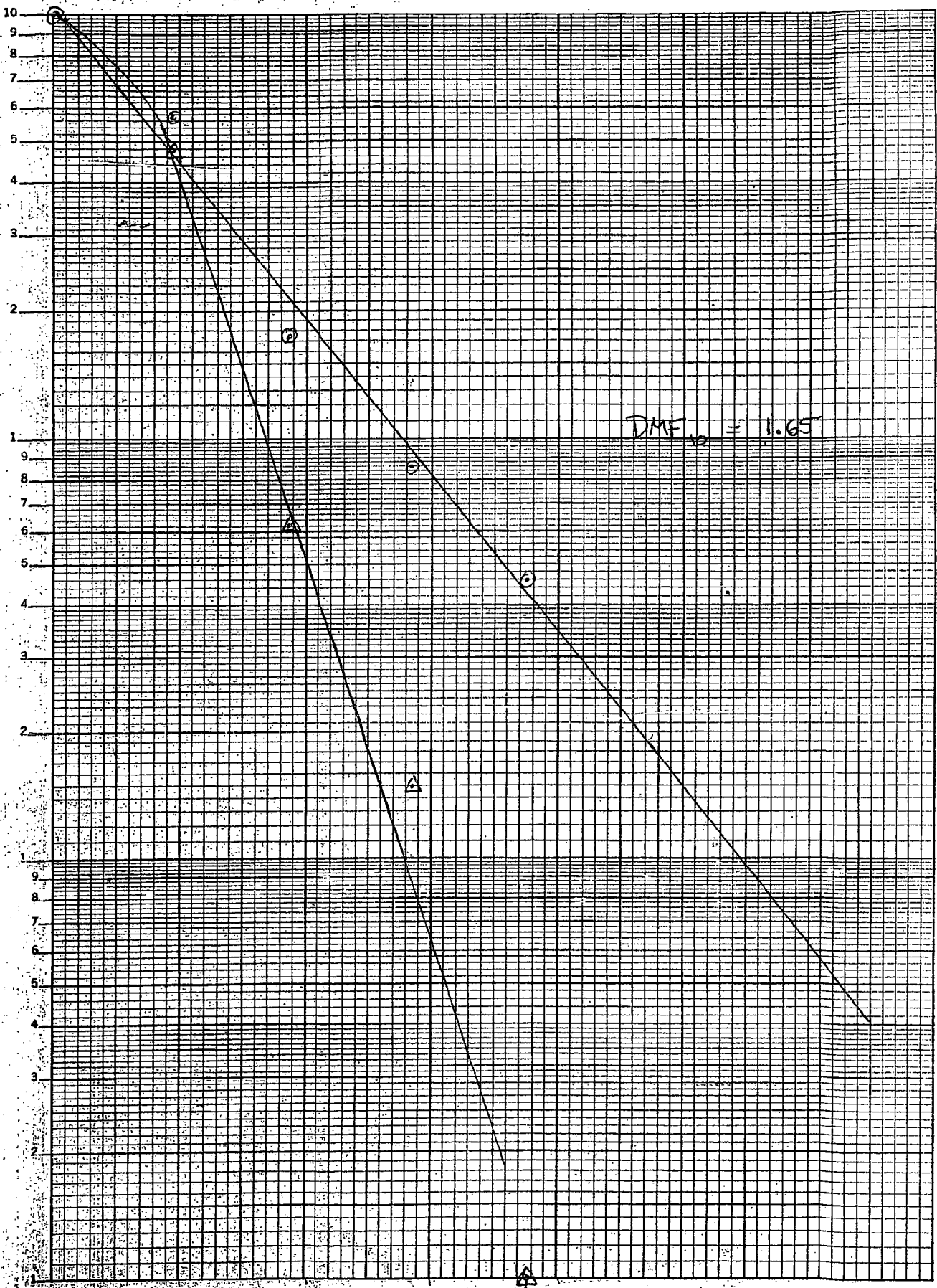
| | | <u>Aug.</u> | <u>Srv.</u> |
|------|------------|------------------|-------------|
| 1.2 | 19, 12, 12 | 14.3 | - |
| 2.2 | 7, 7, 11 | 8.3 | 0.58 |
| 3.3 | 19, 36, 20 | 25 | 0.175 |
| 4.3 | 10, 7, 20 | 12.3 | 0.086 |
| 5.4 | 73, 65, 59 | 65.7 | 0.046 |
| 6.2 | 7, 12, 14 | 11 11 | - |
| 7.2 | 1, 7, 8 | 5.3 | 0.48 |
| 8.3 | 2, 8, 10 | 6.7 | 0.061 |
| 9.3 | 3, 2, 0 | 1.7 | 0.015 |
| 10.4 | 0, 0, 0 | 0 | 0 |

Exp. 1 Results

- cryotoxicity a problem at 41°F
- P-32 not taken up significantly to interfere with dosimetry.
- Initially thought problem was serum - tests indicated serum appeared to provide adequate colony formation.

○ Exp. 1 w/ DMSO
△ Exp. 1 no DMSO

5F



$DMF_{10} = 1.065$

Semi-Logarithmic
1 Cycle x 10 to the inch

10 20 30 40
Hz P-32

03/31/95
07:07



07103

PAGE 1 OF 1



| | |
|--------------|------|
| ORDER NUMBER | PAGE |
| 81474170 | 1 |

E.I. DUPONT de NEMOURS & CO. INC.

MEDICAL PRODUCTS DEPARTMENT
BIOTECHNOLOGY DIVISION
WILMINGTON, DE. 19898

SOLD TO:

NEW JERSEY MEDICAL SCHOOL
MEDICINE & DENTISTRY
PO BOX 10146
NEWARK NJ 07101-3146

IRS NO. 51-0014090

| | | |
|----------------|---|----------------------------------|
| DELIVER TO: | UMDNJ REC DEPT - SOUTH ORANGE AVENUE NEWARK, NEW JERSEY 07103 ATTN: RADIATION SAFETY | 499 |
| | (201) 982-0000 JH/TEB DEL MED R. HOWELL | |
| ISOTOPES: | P32 | |
| TOT ACTIVITY: | .074000 GBQ(| .002000 CI) |
| ATTN: | | |
| ORDER NUMBER | 81474170 | CUSTOMER P. O. NUMBER N228732 |
| SHIP TERMS | FOB DESTINATION | VIA TRUCK |
| PAID | | COLL X |
| SHIPPING POINT | DUPONT/NEN-331 TREBLE COVE RD. N. BILLERICA, MA 01862 B250 | |

| | | | | | | | |
|-----------------|----------------|---------------|-----------|-------------------------|----------------------|-------------|------|
| CUSTOMER NUMBER | SHIPMENT | TECH REP | CSR | LICENSE NUMBER | RADIATION AT SURFACE | INSPECTOR | PKG. |
| 025700 011 | COMPLETE X | 155 | AA | 29-02957-13 | .1500MR/HR | | AB |
| ENTRY DATE | SCHEDULED DATE | SHIPPING DATE | AR NUMBER | TAX | REN | SALES CLASS | |
| 03/30/95 | 03/31/95 | 03/31/95 | 6335814 | LOCATION 52832 CLASS 00 | 09 | 00 | |

| LINE NO. | QUANTITY ORDERED | QUANTITY SHIPPED | PART NUMBER | DESCRIPTION | PACKAGE SIZE | LOT/SERIAL NUMBER |
|----------|------------------|------------------|----------------|--|--------------|-------------------|
| 00 | 1 | 1 | NEX053 0301 | PHOSPHORUS-32 (2.2 ml NENSURE VIAL) 201-982-5067 CHEMICAL FORM: ORTHOPHOSPHORIC ACID IN WATER RADIONUCLIDIC PURITY: 99.00 RADIOCHEMICAL PURITY: 99.00 ASSAYED DATE: 04/12/95 PRINCIPAL CONTAMINANTS: NONE DETECTED SPECIFIC ACTIVITY: CARRIER FREE CONCENTRATION: 1.00mCi/ML VOLUME: 1.0ML RADIATION UNSHIELDED: 440 MR/HR 154.14000* .00649 | 37000KBO | IMC 03954W |

ANY QUESTIONS REGARDING THIS ORDER CALL: 800-551-2121 3,1

ISOTOPES: P32
D.O.T. LABEL: NO LABEL
TOTAL ACTIVITY: .074000 GBQ
TOTAL ACTIVITY: .002000 CI

TRANS. INDEX: .0

0146

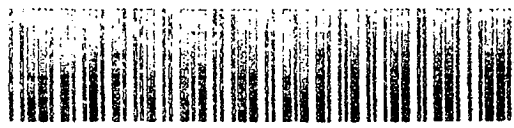
1-1

PACKING LIST

TERMS AND CONDITIONS OF SALE

1. Unless otherwise provided for on the face of this document, title to the goods shall pass to Buyer and the Seller's liability as to delivery shall cease when the goods are unloaded from vehicle, truck or port/airport of destination.
2. SELLER MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, EXCEPT AS STATED HEREIN and in any warranty policy statement(s) which is (are) attached hereto, or which will be supplied to you in conjunction with your receipt of the equipment and which shall form a part of these Terms and Conditions of Sale by this reference thereto. The warranty policy statement is available at any time to you upon request. The warranty policy statement may contain additional limitations, exclusions and other Terms and Conditions of the applicable warranty. Seller, in the exceptions and upon the conditions specified hereon or on the face hereof or in such any warranty policy statement(s) Seller agrees to correct, either by repair or, at its election, by replacement, any defects of material or workmanship which develop within one (1) year after delivery of the instrument to the original purchaser provided that investigation and factory inspection by the Seller discloses that such defect developed under normal and proper use. The exceptions and conditions mentioned above are the following:
 - (a) Some components and accessories by their nature are not intended to and will not function for the warranty period if any such component or accessory manufactured by Seller and part of the item sold fails to give reasonable service for a reasonable period of time. Seller will, at its election, replace or repair such component or accessory. What constitutes reasonable service and what constitutes a reasonable period of time shall be determined solely by Seller after Seller is in possession of all the facts concerning operating conditions and other pertinent factors and after such component or accessory has been returned to Seller, transportation prepaid.
 - (c) Seller's only warranty covering consumables and supplies for the equipment is this: Provided that the consumables and supplies are shipped, handled and stored in accordance with Seller's instructions, Seller shall replace or resupply any consumables or supplies which are not suitable for use prior to the expiration date stated on the package. If no expiration date is stated, Seller warrants that the consumables or supplies are suitable for use for a reasonable time after shipment. What constitutes a reasonable time shall be determined solely by Seller.
 - (d) All items claimed defective must be returned to Seller, transportation charges prepaid, and will be returned to Buyer with the transportation charges prepaid. Seller will be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own or service personnel authorized by it unless such repairs or others are made with the written consent of Seller.
 - (e) The Seller is not obliged to incorporate into its equipment any design, engineering, or performance change development after delivery of equipment to the original purchaser.
 - (f) End use Application of consumables is specifically not warranted unless included as a part of the product specifications.
3. SELLER EXPRESSLY DISCLAIMS LIABILITY TO ITS CUSTOMERS, DEALERS AND REPRESENTATIVES, AND TO USERS OF ITS PRODUCTS, AND TO ANY OTHER PERSON OR PERSONS FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND AND FROM ANY CAUSE WHATSOEVER ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE SALE, HANDLING, REPAIR, MAINTENANCE OR REPLACEMENT OR ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE USE OF SAID PRODUCTS. Representations and warranties made by any person, including dealers and representatives of Seller which are inconsistent or in conflict with the terms of this warranty (including but not limited to the limitations of the liability of Seller as set forth above), shall not be binding upon Seller unless reduced to writing and approved by Seller.
3. No claim of any kind, whether as to goods delivered or for non-delivery of goods, shall be greater in amount than the purchase price of the goods in respect of which such damages are claimed and failure to give notice of claim within ninety (90) days from date of delivery or the date fixed for delivery, or as otherwise provided herein, in paragraph 2, shall constitute a waiver by Buyer of all claims in respect to such goods. No charges or expenses incident to any claims will be allowed unless approved by an authorized representative of Seller. Claims may not be referred to Seller, attorney or agent.
4. The terms of this order apply only to this order and Seller's regular terms of sale apply only to other Buyers. In the event Buyer fails to pay for the goods delivered pursuant to this order Seller shall have any debit or credit balance in Buyer's account with Seller may debit to the account of Buyer for the amount of cash or credit balance in Buyer's account with Seller, but Buyer shall be subject to a late payment charge on any such debit.
5. Buyer shall be responsible for all taxes, excise or other charges which Seller may be required to pay to any Government (national, state or local) with the sale, production or transportation of the product and its shipment.
6. No liability on part of the Seller shall result from delay in performance or non-performance of this agreement, directly or indirectly, caused by fire, explosion, accidents, flood, labor trouble or other causes not controlled by any Government liability or transportation, strike, national emergency, fire, war, or transportation or act of God or arising from circumstances, dependencies or delays beyond the control of the party affected. This shall not apply to such circumstances which are eliminated without delay, but this agreement shall otherwise remain in effect.
7. Seller warrants that the design and construction of the product delivered hereunder shall not infringe the claims of any United States patent or copyright, or be subject to any claim of infringement against the product or its use, when used in accordance with the instructions and the operation of any process.
8. Seller shall not be liable for any liability by Buyer, its agent or employee, or for any other person or entity.
9. Seller warrants that all goods, designs, trademarks and have been produced in compliance with the requirements of the Fair Labor Standards Act of 1938, as amended.
10. On request and at its discretion the Seller will furnish such technical data or assistance as is available in reference to the use of its products by Buyer. However, Seller does so solely on the condition that the skilled personnel employed by Buyer will evaluate such action or assistance with regard to suitability for Buyer's purposes. It is therefore expressly understood that Buyer uses such data or assistance in its own risk. Seller assuming no responsibility for such use or the results claimed.
11. The terms of the Terms of Delivery and the Terms of Contract.
12. In the event of a liability for any reason, to supply the total demands for the material specified herein, Seller may allocate its available supply among any of all purchasers in its various departments and divisions and Seller, on such basis as it may deem fair and equitable, without liability for any failure of performance which may result therefrom.
13. In the event that an annual purchase contract covering the goods to be purchased hereunder shall be affected between the Seller and Buyer while the goods are under the terms of a purchase order, the conditions contained herein shall not apply and the transaction with respect to those goods so covered.
14. It is understood and agreed between Buyer and Seller that if this agreement covers products (or materials) that must necessarily be manufactured, assembled or processed by Buyer and if supplies for such products have been depleted and such supplies are needed for such products, or if such supplies are needed by Seller, provided that if Buyer for any reason cannot accept delivery of such products, he will make payment therefor as though delivery had been made and Seller will store such products for Buyer's account and at Buyer's expense.
15. Buyer acknowledges that it has received and is familiar with Seller's shipping and handling information and that it will forward such information to its respective consignees, carriers, or other such products and materials to be shipped hereunder.
16. This acknowledgment and the policy statement attached hereto constitute the entire agreement between the Seller and Buyer and no modification of the terms and conditions shall be of any force unless such modification is in writing and signed by the party claimed to be modified. The terms and conditions contained herein shall apply to all orders placed on the front side of this document.

02/31/95
07:07



07103



PAGE 1 OF 1

ORDER NUMBER PAGE
81474170 1

E.I. DUPONT de NEMOURS & CO. INC.
MEDICAL PRODUCTS DEPARTMENT
BIOTECHNOLOGY DIVISION
WILMINGTON, DE. 19898

DELIVER TO: UMDNJ
REC DEPT - SOUTH ORANGE AVENUE 499
NEWARK, NEW JERSEY 07103
ATTN: RADIATION SAFETY

(201) 982-0000
JH/TEB
DEL MED
R. HOWELL
ISOTOPES: P32
TOT ACTIVITY: .074000 GBQ(.002000 CI)

SOLD TO:

NEW JERSEY MEDICAL SCHOOL
MEDICINE & DENTISTRY
PO BOX 10146
NEWARK NJ 07101-3146

ATTN:
81474170 N228732
ORDER NUMBER 11 CUSTOMER P. O. NUMBER
SHIP TERMS VIA PAID COLL
FOB DESTINATION TRUCK X
SHIPPING POINT DUPONT/NEN-331 TREBLE COVE RD.
N. BILLERICA, MA 01862 B250

IRS NO. 51-0014090

| | | | | | | | |
|-----------------|-----------------------|---------------|-----------|----------------|----------------------|-----------|-----------------|
| CUSTOMER NUMBER | SHIPMENT | TECH REP | CSR | LICENSE NUMBER | RADIATION AT SURFACE | INSPECTOR | PKG. |
| 025700 011 | COMPLETE PARTIAL X | 155 | AA | 29-02957-13 | .1500MR/HR | | AB |
| ENTRY DATE | SCHEDULED DATE | SHIPPING DATE | AR NUMBER | TAX | LOCATION | CLASS | REN SALES CLASS |
| 03/30/95 | 03/31/95 | 03/31/95 | 6335814 | 52832 | 00 | 09 | 00 |

| LINE NO. | QUANTITY ORDERED | QUANTITY SHIPPED | PART NUMBER | DESCRIPTION | PACKAGE SIZE | LOT/SERIAL NUMBER |
|----------|------------------|------------------|----------------|--|-----------------|-------------------|
| 001 | 1 | 1 | NEX053 0301 | PHOSPHORUS-32 (2.2 ml NENSURE VIAL) 201-982-5067 CHEMICAL FORM: ORTHOPHOSPHORIC ACID IN WATER RADIOISOTOPIC PURITY: 99.00 RADIOCHEMICAL PURITY: 99.00 ASSAYED DATE: 04/12/95 PRINCIPAL CONTAMINANTS: NONE DETECTED SPECIFIC ACTIVITY: CARRIER FREE CONCENTRATION: 1.00mCi/ML VOLUME: 1.0ML RADIATION UNSHIELDED: 440 MR/HR 154.14000* .00649 | 1MC 37000KBQ | 03954W |

ANY QUESTIONS REGARDING THIS ORDER CALL: 800-551-2121 3,1 0146
ISOTOPES: P32
D.O.T. LABEL: NO LABEL
TOTAL ACTIVITY: .074000 GBQ TRANS. INDEX: .0 COPY
TOTAL ACTIVITY: .002000 CI 1-1

TERMS AND CONDITIONS OF SALE

1. Unless otherwise provided for on the face of this document, title to the goods shall pass to Buyer and the Seller's liability as to delivery shall cease when the goods are unloaded from vessel/aircraft at port/airport of destination.
2. SELLER MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, EXCEPT AS STATED HEREIN and in any warranty policy statement(s) which is (are) attached hereto, or which will be supplied to you in conjunction with your receipt of the equipment and which shall form a part of these Terms and Conditions of Sale by this reference thereto. The warranty policy statement is available at any time to you upon request. The warranty policy statement may contain additional limitations, expansions and other Terms and Conditions of the applicable warranty. Subject to the exceptions and upon the conditions specified herein or on the face hereof or in such any warranty policy statement(s) Seller agrees to correct, either by repair or, at its election by replacement, any defects of material or workmanship which develop within one (1) year after delivery of the instrument to the original purchaser, provided that investigation and factory inspection by the Seller discloses that such defect developed under normal and proper use. The exceptions and conditions mentioned above are the following:
 - (a). Some components and accessories by their nature are not intended to and will not function for the warranty period. If any such component or accessory manufactured by Seller and part of the item sold fails to give reasonable service for a reasonable period of time, Seller will, at its election replace or repair such component or accessory. What constitutes reasonable service and what constitutes a reasonable period of time shall be determined solely by Seller after Seller is in possession of all the facts concerning operating conditions and other pertinent factors and after such component or accessory has been returned to Seller, transportation prepaid.
 - (b). Seller's only warranty covering consumables and supplies for the equipment is this: Provided that the consumables and supplies are shipped, handled and stored in accordance with Seller's instructions, Seller shall replace at its expense any consumables or supplies which are not suitable for use prior to the expiration date stated on the package. If no expiration date is stated, Seller warrants that the consumables or supplies are suitable for use for a reasonable time after shipment. What constitutes a reasonable time shall be determined solely by Seller.
 - (c). All items claimed defective must be returned to Seller, transportation charges prepaid, and will be returned to Buyer with the transportation charges prepaid. Seller will be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own or service personnel authorized by it unless such repairs by others are made with the written consent of Seller.
 - (d). The Seller is not obliged to incorporate into the equipment any design, engineering, or performance change development after delivery of equipment to the original purchaser.
 - (e). End use Application of consumables is specifically not warranted unless included as a part of the product specifications.
- SELLER EXPRESSLY DISCLAIMS AND LIABILITY TO ITS CUSTOMERS, DEALERS AND REPRESENTATIVES, AND TO USERS OF ITS PRODUCTS, AND TO ANY OTHER PERSON OR PERSONS FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND AND FROM ANY CAUSE WHATSOEVER ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE SALE, HANDLING, REPAIR, MAINTENANCE OR REPLACEMENT OR ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE USE OF SAID PRODUCTS.

Representations and warranties made by any person, including dealers and representatives of Seller, which are inconsistent or in conflict with the terms of this warranty (including but not limited to the limitations of the liability of Seller as set forth above), shall not be binding upon Seller unless reduced to writing and approved by Seller.
3. No claim of any kind, whether as to goods delivered or for non-delivery of goods, shall be greater in amount than the purchase price of the goods in respect of which such damages are claimed, and failure to give notice of claim within ninety (90) days from date of delivery or the date fixed for delivery, or as otherwise provided herein, in paragraph 2, shall constitute a waiver by Buyer of all claims in respect to such goods. No charges or expenses incident to any claims will be allowed unless approved by an authorized representative of Seller. Goods shall not be returned to Seller without Seller's permission.
4. The terms of payment applicable to this order are Seller's regular terms or those specifically quoted to Buyer. In the event Buyer fails to fulfill the terms of payment, or in case Seller shall have any doubt at any time as to Buyer's financial responsibility, Seller may decline to make further deliveries except upon receipt of cash or satisfactory security. All bills not paid at maturity will be subject to a late payment service charge.
5. Buyer shall reimburse Seller for all taxes, excise or other charges which Seller may be required to pay to any Government (national, state or local) upon the sale, production or transportation of the products sold hereunder.
6. No liability on part of the Seller shall result from delay in performance or non-performance of this agreement, directly or indirectly caused by fire, explosion, accidents, flood, labor trouble or shortage, war, act of, or authorized by any Government, inability to obtain suitable material, equipment, fuel, power or transportation, or act of God or arising from contingencies, happenings, or causes beyond the control of the party affected. Items so affected by any such circumstances may be eliminated without liability, but this agreement shall otherwise remain unaffected.
7. Seller warrants that the use or sale of the product delivered hereunder will not infringe the claims of any United States patent covering the product itself, but does not warrant against infringement by reason of the use thereof in combination with other products or in the operation of any process.
8. This contract is not assignable or transferable by Buyer, in whole or in part, except with the written consent of Seller.
9. Seller warrants that all goods covered hereunder will have been produced in compliance with the requirements of the Fair Labor Standards Act of 1938, as amended.
10. Upon request and at its discretion the Seller will furnish such technical advice or assistance as is available in reference to the use of its product by Buyer. However, Seller does so solely on the condition that qualified persons employed by Buyer will evaluate such advice or assistance with regard to suitability for Buyer's purposes. It therefore is expressly understood that Buyer uses such advice or assistance at his own risk, Seller assuming no obligation or liability for such use or the results obtained.
11. The laws of the State of Delaware shall govern this contract.
12. In the event of inability for any reason to supply the total demands for the material specified herein, Seller may allocate its available supply among any or all purchasers, as well as departments and divisions of the Seller, on such basis as it may deem fair and practical, without liability for any failure of performance which may result therefrom.
13. In the event that an annual purchase contract covering the goods to be purchased hereunder is in effect between the Seller and Buyer at the date of this transaction, the terms and conditions contained therein will control this transaction with respect to those goods so covered.
14. It is further understood and agreed between Buyer and Seller that if this agreement covers products (or materials) that must necessarily be manufactured especially for Buyer and is suspended or terminated for any reason, Buyer will take delivery of and make payment for such products as have been completed and such as are in process on the date notice of suspension or termination is received by Seller; provided, that if Buyer for any reason cannot accept delivery of such products, he will make payment therefor as though delivery had been made and Seller will store such products for Buyer's account and at Buyer's expense.
15. Buyer acknowledges that it has received and is familiar with Seller's labeling and literature concerning the products (or materials) sold hereunder and will forward such information to its employees who handle, process or sell such products and customers of such products, if any.
16. This document and any warranty policy statement attached hereto contain all the terms and conditions with respect to the sale and purchase of the material named herein, and no modification of these terms and conditions shall be of any force unless such modification is reduced to writing and signed by the party claimed to be bound thereby. These terms and conditions contained herein supersede any except those noted on the front side of this document.

Experiment 2

P32 + 5% DMSO at ~~4x10⁵~~ 38°F V79 Cells

4/25/95

Purpose: Determine extent of protection provided by 5% DMSO against P-32.

Procedure: Trypsinize cells and resusp @ 400,000/ml and put on ice.
 Prepare 10% DMSO in MEMA and put on ice.
 Add ingredients according to Table below.
 Roll 3 days in refrig. at 38°F.
 Remove, ~~wash~~ add 8 ml MEMA & mix.
 Centrif., decant,
 Wash 3X with 10ml MEMA.
 Resusp. in 2 ml MEMA, syringe 6X.
 Dilute serially and plate 1 ml aliquots of dilutions into flasks containing 4ml MEMA.
 Incubate 1 wk at 37°C 5% CO₂ 95% air.
 Stain colonies & count.

$$\frac{4/12/95 \text{ 1 } \mu\text{Ci/ml}}{4/25/95 \text{ } e^{-0.693(13)/14.28}} = 0.532 \frac{\mu\text{Ci}}{\text{ml}}$$

| | MEMA w/10% DMSO (ml) | MEMA (ml) | MEMA 4x10 ⁵ cells (ml) | μCi P-32 | ↓ μl P-32 | Dose Approx (rad) | Dilutions to Plate |
|----|----------------------|-----------|-----------------------------------|----------|--------------|-------------------|-----------------------------------|
| 1 | 1 | 0 | 1 | 0 | 0 | 0 | 10 ² |
| 2 | 1 | 0 | 1 | 9.4 | 17.7 | 400 | 10 ² |
| 3 | 1 | 0 | 1 | 18.8 | 35.3 | 800 | 10 ² , 10 ³ |
| 4 | 1 | 0 | 1 | 28.2 | 53.0 | 1200 | 10 ² , 10 ³ |
| 5 | 1 | 0 | 1 | 37.6 | 70.7 | 1600 | 10 ³ , 10 ⁴ |
| 6 | 0 | 1 | 1 | 0 | 0 | 0 | 10 ² |
| 7 | 0 | 1 | 1 | 9.4 | 17.7 | 400 | 10 ² |
| 8 | 0 | 1 | 1 | 18.8 | 35.3 | 800 | 10 ² , 10 ³ |
| 9 | 0 | 1 | 1 | 28.2 | 53.0 | 1200 | 10 ² , 10 ³ |
| 10 | 0 | 1 | 1 | 37.6 | 70.7 | 1600 | 10 ³ , 10 ⁴ |

Colonies

1.2 2, 11, 5
2.2 2, 6, 7
3.3 14, 33, 37
4.3 10, 13, 16
5.4 52, 61, 51
6.2 0, 1, 1
7.2 0, 0, 1
8.3 2, 2, 2
9.3 0, 0, 2
10.4 0, 2, 2



large difference in controls w/
and without DMSO suggests that
DMSO is acting as a cryoprotector
more than a radioprotector.

Low survival of controls indicates
extreme cryotoxicity when cells are
rolled 3d at 38°F in refrigerator.

Next step: determine optimal temp.

Purpose: Re-examine ^{the} cytotoxicity at 48°F.

Procedure: Suspend cells at 400,000 cells/ml
Place 2 ml in tube on roller @ 48°F in refrig.
Serially dilute additional cells to 400/ml & plate for controls

5/8/95. Remove tube from refrig.
Cell count before syringing low 400's
Cell count after syringing 812, 816, 815

Serially dilute 3 X 10X
Plate cells into flasks

| | | |
|----------------------------|---------------|--------------|
| Controls (stained 5/12/95) | 322, 325, 300 | |
| 48°F (stained 5/15/95) | 240, 233, 263 | 78% survival |

Exp. #3b Cytotoxicity at 43°F

Cutter stock 6200 → dilute ~ 12 times 0.5 ml + 5.5 ml MEM
580 after dilution

Test tube - 3 days at 43°F. Cutter count after synthesize SX 583.

| | | |
|----------------------------|----------|--------------------|
| Controls (stained 5/16/95) | Normal # | |
| 43°F | 0, 0, 0 | <u>0% survival</u> |

GIBCOBRL



LIFE TECHNOLOGIES, INC.
8637 Governor Circle
Gaithersburg, MD 20884-9980-USA
Phone No: 1-800-828-6688
Telex 64210 BRLGARG UJW
FEDERAL ID# 340431300

| | | |
|------------|------|--------------|
| ORDER DATE | PAGE | ORDER NUMBER |
| 5/03/95 | 1 | 4 57823 A |
| | | 020 |

TO

SHIP TO

UNIV OF MED & DENT OF NJ
ACCOUNTING
PO BOX 10146
NEWARK, NJ

07101

UNIV OF MED & DENT OF NJ
185 SOUTH ORANGE AVE
MSB F-451
NEWARK, NJ

07103

ATTN: DR. HOWELL

F.O.B.
CARRIER UPS OVERNIGHT

5/03/95

CUSTOMER CODE: 130684

(201) 982-504

| | | | | |
|---------------|-------------------|-----------------------|-------------|------------|
| CUSTOMER REP. | CUSTOMER P.O. NO. | CUSTOMER CONTRACT NO. | RELEASE NO. | PLACED BY |
| MS | NO249469 | | | DR. HOWELL |

| LINE NO. | CATALOG NUMBER | LOT NO. | BIN NO. | DESCRIPTION | QUANTITY ORDERED | QUANTITY SHIPPED |
|----------|----------------|------------|---------|--|------------------|------------------|
| 1.0 | 25030-016 | 11K8053 | | ** (OLD CAT. NO. 3205030AG) ** GLUTAMINE 100X | 1 | 1 |
| | | DI FB07 | | 100ML | | |
| 2.0 | 15070-014 | 24N7051 | | ** (OLD CAT. NO. 605070AG) ** PENICILLIN STREPTOMYCIN | 1 | 1 |
| | | DI FB23 | | 100ML | | |

UPS OVERNIGHT

PACKING SLIP

ALL CLAIMS FOR DAMAGED GOODS AND DISCREPANCIES MUST BE REPORTED TO CARRIER OR GIBCO BRL WITHIN THREE (3) WORKING DAYS

| | | | | | | | | |
|------|------------|---|---------|---------|-----------------|------------|-------------|-----------------|
| PULL | CHECKED BY | 3 | DRY ICE | COOLANT | PICK-UP CHARGES | NO. CARTON | WEIGHT (LB) | FREIGHT CHARGES |
| | | | *** ** | | | 1 | | |

PACKING SLIP

**TERMS and CONDITIONS under which
LIFE TECHNOLOGIES INC. SELLS PRODUCTS
to THIRD PARTIES**

1. **Acceptance Governing Provisions** - Life Technologies Inc. (LTI) acknowledges receipt of Buyer's order, and has shipped these goods expressly conditional on Buyer's assent to the terms and conditions herein contained, as well as in LTI's catalogue, whether additional to or different from those contained in Buyer's purchase order, if any, or any other form or document heretofore or hereafter supplied by Buyer to LTI. Buyer will be deemed to have assented to these terms and conditions unless Buyer returns the product to LTI within 15 days after Buyer's receipt of the product, and this form. LTI hereby objects to and rejects any different terms or terms additional to those incorporated herein, and any attempt by Buyer to vary in any degree any of the terms herein. LTI's failure to object to provisions contained in any purchase order or any other form or document from Buyer shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provision.

2. **Complete Contract** - The terms included hereto are the entire contract, and supersede all prior agreements and understandings between the parties, whether written or oral, relating to the subject matter hereof. No change to any term or condition of this contract or any of LTI's rights or remedies hereunder shall be binding on LTI, unless the purchase order hereby acknowledged be canceled or changed by Buyer, unless LTI shall expressly consent thereto in writing by LTI's authorized officer. There are no representations, agreements, promises or understandings between Buyer and LTI that are not expressed herein. In the event that one or more of the terms herein shall for any reason be held to be invalid, illegal, or unenforceable by a court of competent jurisdiction, the remaining terms shall be unimpaired.

3. **Delivery, Delays** - Unless specified differently in writing, all sales are F.O.B. LTI's shipping point. Delivery of goods to the carrier at LTI's plant or other loading point, shall constitute delivery to Buyer and regardless of shipping terms, all risk of loss or damage in transit shall be borne by Buyer. LTI reserves the right to make delivery in installments, all such installments to be separately invoiced and paid for when due per invoice; without regard to subsequent deliveries. Delay in delivery of any installment shall not relieve Buyer of Buyer's obligations to accept remaining deliveries.

4. **Inspection** - Immediately upon Buyer's receipt of any goods shipped hereunder, Buyer shall inspect the same and shall notify LTI in writing of any claims for shortages, defects or damages and shall hold any such goods for LTI's written instructions concerning disposition. If Buyer shall fail to so notify LTI within five days after the goods have been received by Buyer at Buyer's premises, such goods shall conclusively be deemed to conform to the terms and conditions hereof and to have been irrevocably accepted by the Buyer.

5. **Claims** - LTI shall not be liable for any loss, damage or penalty as a result of any delay in or failure to manufacture, deliver or otherwise perform hereunder due to any cause beyond LTI's reasonable control, including, without limitation, act(s) of Buyer, embargo or other governmental act, regulation or request affecting the conduct of LTI's business, fire, explosion, accident, theft, vandalism, riot, acts of war, strikes or other labor difficulties, lightning, flood, windstorm or other acts of Nature, delay in transportation, or inability to obtain necessary labor, fuel, materials, supplies or power at current prices.

6. **Allocation of Goods** - If LTI is unable for any reason to supply the total demands for goods specified in Buyer's order, LTI may allocate its available supply among any or all buyers on such basis as LTI may deem fair and practical, without liability for any failure of performance which may result therefrom.

7. **Payments** - Terms of sale are net 30 days of date of invoice, unless otherwise stated. Prices are subject to change without notice. Products will be billed at the price in effect at the time shipment is made. If the financial condition of Buyer does not justify the terms of payment specified herein, LTI may demand full or partial payment in advance before proceeding with the contract. If Buyer defaults in any payment when due, under this or any other order, LTI, at its option without prejudice to its other lawful remedies, may defer delivery or cancel this contract. Payments will be made in US Dollars unless otherwise specified by LTI on the face of this document.

8. **Taxes and Other Charges** - Any use tax, sales tax, excise tax, duty, customs, inspection or testing fee, or any other tax, fee or charge of any nature whatsoever imposed by any governmental authority on or measured by the transaction between LTI and Buyer shall be paid by Buyer in addition to the prices quoted or invoiced. In the event LTI is required to pay any such tax, fee or charge, Buyer shall reimburse LTI therefor, or in lieu of such payment, Buyer shall provide LTI at the time the order is submitted an exemption certificate or other document acceptable to the authority imposing the tax, fee or charge.

9. **Warranties** - LTI warrants that its products shall conform substantially to the description of such products as provided in LTI's catalog and product literature accompanying the product. THIS WARRANTY IS EXCLUSIVE, AND LTI MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. LTI's warranty shall terminate in connection with this sale shall not be effective if LTI has determined, in its sole discretion, that Buyer has misused the products in any manner or has failed to use the products in accordance with instructions, if any, furnished by LTI. LTI's sole and exclusive liability and Buyer's exclusive remedy with respect to products proved to LTI's satisfaction to be defective or nonconforming shall be the replacement of such products without charge or refund of the purchase price, upon the return of such product to LTI in accordance with LTI's instructions. The stated express warranties, and the remedy provided for breach thereof, are in lieu of all other liability or obligations of LTI for any damages whatsoever arising out of or in connection with the delivery, use, or performance of the product. IN NO EVENT SHALL LTI BE LIABLE UNDER ANY LEGAL THEORY (INCLUDING BUT NOT LIMITED TO CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR WARRANTY OF ANY KIND) FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES (INCLUDING BUT NOT LIMITED TO LOST PROFITS), EVEN IF BUYER HAD NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. Without limiting the effect of the preceding sentence, LTI's maximum liability, if any, for damages (including but not limited to liability arising out of contract, negligence, strict liability, in tort or warranty of any kind) shall not exceed the purchase price paid by Buyer for the product.

10. **Compliance with Laws and Regulations** - LTI certifies that to the best of its knowledge its products are produced in compliance with all applicable federal, state, and local statutes, rules, regulations, ordinances, and orders, including applicable requirements of the Fair Labor Standards Act, as amended and the Occupational Safety and Health Standards Act of 1970 and regulations, rules and orders issued pursuant thereto. LTI also certifies that to the best of its knowledge it is in compliance with Executive Order 11246 and regulations, rules and orders issued pursuant thereto; that it has a written Affirmative Action Program and annually files Standard Form 100 (EEO-1); that it does not discriminate against any employee or prospective employee on the basis of race, creed, color, national origin, sex, age or handicap, nor permit discrimination in any form nor maintain segregated facilities for its employees; that it actively pursues employment of minorities, females, handicapped, disabled veterans and veterans of the Vietnam era; and that it used its best efforts to award contracts to and place purchase orders with minority business enterprises and with labor surplus area concerns and small business concerns.

11. **Buyer's Use of Products** - LTI's products are intended primarily for laboratory research purposes and, unless otherwise indicated on the front of LTI's invoice or on product labels, are not to be used for any other purposes, including but not limited to, *in-vitro* diagnostic purposes, in foods, drugs or cosmetics for humans or animals or for commercial purposes. Buyer acknowledges that the products have not been tested by LTI for safety and efficacy in food, drug, device, cosmetic, commercial or any other use, unless otherwise stated in LTI's literature furnished to Buyer. Buyer expressly represents and warrants to LTI that Buyer will properly test, use, manufacture and market any products purchased from LTI and any final articles made from them in accordance with the practices of a reasonable person who is an expert in the field and in strict compliance with all applicable federal and state food, drug, device, and cosmetic and other relevant laws and regulations, now and hereinafter enacted. Buyer further warrants to LTI that any final articles manufactured from LTI's products shall not be adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act and shall not be articles which may not be on the Toxic Substances Control Act (TSCA) inventory. Buyer assumes responsibility to assure that the products purchased from LTI are approved for use under TSCA, if applicable. Buyer has the responsibility to verify the hazards and to conduct any further research necessary to learn the hazards involved in using products purchased from LTI. Buyer also has the duty to warn Buyer's customers and any auxiliary personnel (such as freight handlers, etc.) of any risks involved in using or handling the products. Buyer agrees to comply with instructions, if any, furnished by LTI relating to the use of the products and not misuse the products in any manner. If the products purchased from LTI are to be repackaged, relabeled or used as starting materials or components of other products, Buyer will verify LTI's assay of the products. No products purchased from LTI shall be considered to be foods, drugs or cosmetics; nor, except if labeled "For *In-Vitro* Diagnostic Use", to be devices.

12. **Indemnity** - Buyer will, at its own cost and expense, indemnify and hold LTI harmless from and against any and all losses, damages and expenses (including reasonable attorney's fees and other costs of defending any action) that LTI may sustain or incur as a result of any claim of negligence, breach of implied warranty, strict liability in tort or other theory of law, by Buyer, its officers, agents or employees, its successors and assigns, and its customers, whether direct or indirect, in connection with the use or resale of LTI's products, or by reason of Buyer's failure to perform the obligations herein contained. Buyer shall notify LTI within 15 days of Buyer's receipt of knowledge of any accident involving LTI's products resulting in personal injury or damage to property, and Buyer shall fully cooperate with LTI in the investigation and determination of the cause of such accident and shall make available to LTI all statements, reports and tests made by Buyer or made available to Buyer by others. The furnishing of such information to LTI and any investigation by LTI shall not constitute an assumption of any liability by LTI.

13. **Patent Disclaimer, Indemnity** - Seller does not warrant that the use or resale of the products delivered hereunder will not infringe the claims of any United States or other patents, trademarks or copyright covering the product itself or the use thereof in combination with other products or in the operation of any process. Buyer will indemnify and hold Seller, its subsidiaries, affiliates, and distributors harmless from any and all liability for any such infringement by Buyer, including without limitation damages, costs, and expenses (including reasonable counsel fees), arising from any claim that the use or resale of any goods supplied hereunder infringe any patent, copyright, or trademark, and Buyer shall, when notified, defend any action or claim of such infringement at its own expense.

14. **Technical Assistance** - At Buyer's request, LTI may furnish technical assistance and information with respect to LTI's products. Unless otherwise agreed, all such technical assistance and information will be provided gratis, and Buyer assumes sole responsibility for results obtained in reliance thereon. LTI makes no warranties of any kind or nature with respect to technical assistance or information provided by it. Any suggestions by LTI regarding use, application or suitability of the products shall be construed as an express warranty unless expressly designated as such in writing signed by LTI.

15. **Applicable Law** - The rights and obligations of all persons, and the construction and effect of the terms and conditions contained herein shall be governed by and construed in accordance with the laws of the State of Maryland, without giving effect to the principles of conflict of laws.

16. **Waiver** - LTI's exercise of any option, or its failure to exercise any rights hereunder shall not constitute a waiver of its rights to damages for breach of contract and shall not constitute a waiver of any subsequent failure, delay, or breach by Buyer.

17. **Assignment** - LTI may assign in whole or in part, to any person, its rights or obligations under the terms and conditions contained herein.