MM-B

SUMMARY RADIATION CYTOGENETICS PROPOSAL

Primary to a proper study is the evolution of a comprehensive questionnaire. The uranium miner cytogenetic questionnaire, prepared by Drs. Geno Saccomanno, Victor Archer, and myself, can and should be modified for this study. Among the reasons for the questionnaire is to screen for possible chromosome-changing agents other than occupational radiation exposure; recent diagnostic X-rays, therapeutic irradiation, recent viral infections, etc. Demographic data, extensive clinical history, radiation dose history, age, reproductive history, and smoking history, are also essential information for a careful study.

Unit Effort 1 (Year 1)

On a first-year basis, we recommend the following subgroups be studied cytogenetically.

1) All New Workers or New Workers Who Might Eventually Work in Hot Areas

If approximately 100 new workers are employed each year, probably something on the order of 70 would remain after the screening process. This is based on our experience with the uranium miners and, perhaps, excluding new clerical staff. We propose to read 50 cells on the new workers. This number of cells should be sufficient to detect aberration frequencies above a general populational level. Furthermore the slides would be stored so that at a future date (e.g. in case of exposure), we could read up to a hundred cells, when indicated.

2) F_1 Individuals Fathered by Workers, Post-Irradiation

During the year we would expect to do 10 offspring, probably from

cooperative hot area workers who show some exceptional kind or prevalence of aberrations. We would read 5 cells per individual and employ banding techniques.

3) Workers with 0.1 MPBB (approximately 200)

In the first year, we intend to culture and analyze 100 of these individuals. We had intended at first to do all of them, in addition to the other categories, but Dr. Bloom believes that we would be over-extending ourselves and should obtain a thoroughly done, base-point population. Further comments from Arthur Bloom in regards to this statement are included in the proposed subsequent years' efforts.

4) Extending out the Pilot Study Categories

As noted in earlier communications, we believe the pilot study findings very interesting but in need of worker population and cell population increases. Dr. Bloom and I believe the following should be done:

	Total Needed	Pilot Study	Additional
Cold Area Workers	25	6	19*
Hot Area Workers	25	7	18
Internally Exposed Workers	27	27	0
Total Men	77	40	37
Total Cells (approx.) 100 cells per man	7,700	3,955	3,700

*Some of the additional cold area workers might come from new workers (Item 1).

We deem the expansion of the pilot study to a scientifically respectable population and cell size very important. Firstly, we will be maximizing the effort, costs, and time already put into the pilot study. More importantly, after blind reading, it will be of interest to determine whether the

initial pilot study findings are comfirmed or not comfirmed in the cold and hot area workers.

In summary, we anticipate that we can procure, culture, harvest, and carefully analyze 217 workers in a first year effort and within the budget requested below.

The following comments should preface any projections for cytogenetic directions and efforts beyond the first year. Firstly, there are difficulties in projecting without knowing what the findings will be from the first-year effort. Again, in consultation with Dr. Bloom, he emphasizes the foregoing point. But keeping in mind certain budgetary constraints, we believe the following might be considered prudent.

Unit 2

1) Continue to do 70 new workers per year.

2) Do 10 F_1 individuals per year.

3) Complete the second 100 workers with 0.1 MPBB. We believe that a compromise between 50 and 100 cells per man (75) is the best estimate of future cells quantitation, but this will depend on the findings from 10,000 cells read on the first 100 in this category of exposure.

4) Do analyses on 50 men, either with less than 0.1 MPBB or hot area workers, without measureable internal burdens.

Unit 3

1) 70 new employees

2) 10 F_1 individuals

3) Depending on the findings in Year 2 (of Unit 2), 150 men in the hot area or less than 0.1 MPBB categories, or a combination of these categories, might prove valuable.

Unit 4

1) Same as Unit 3

Unit 5

1) Same as Unit 3

If the foregoing effort could be maintained and were not seriously modified by the findings, we would have achieved a cytogenetically intense effort involving 1,137 men. I would caution that this effort is dependent on the availability and cooperation of the men, steady procurement of blood samples from 6 men per week, throughout the work year, and other unanticipated vicissitudes. The costs beyond the first year or unit of effort may vary by a factor of 1/4 to 1 above the constraints mentioned to me, but the cost estimates will become more precise with each subsequent phased effort. Every effort will be made to keep a tight, efficient operation.

First Year (Unit 1) Budget Estimate

If a budgetary breakdown is necessary, I will provide it. However, I judge that a cost of $196 per man (down from $301.50 per man in the pilot study) is a figure that we could meet. The total of 217 men at $196 each is $42,531. This would be the subcontract figure to the University of Denver but does not include my consulting time. As with the prior work, I recommend that reimbursement for my time be done separately. This would save DOW Chemical the indirect costs and fringe benefits to the University of Denver (total, 65.2% of direct personnel costs) on payments for my time. Internally, the appropriate University officials are aware, and have approved the consultantship arrangement. I see no problem in an agreement being arrived at to our satisfaction in terms of consulting time costs for myself, and the total costs would not exceed the cost constraints that I have been given.

I prefer to await the outcome of the first-year results before going into budgetary considerations for the ensuing additional 4-units (years ?) of effort. However, I welcome your suggestions on the latter.

Respectfully submitted,

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