



NEW JERSEY MEDICAL SCHOOL

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CONFIDENTIAL

June 22, 2001

TO: Robert A. Saporito, D.D.S.
Senior Vice President for Academic Affairs

FROM: Elizabeth Raveché, PhD. *Elizabeth Raveché*
Professor, Department of Pathology & Laboratory Medicine, NJMS
Chair, Newark Campus Committee on Research Integrity

RE: **REPORT OF INITIAL INQUIRY BY NEWARK CAMPUS COMMITTEE ON
RESEARCH INTEGRITY**

Enclosed is the report of an initial inquiry conducted by the Newark Campus Committee on Research Integrity in response to an allegation of scientific misconduct. This report is sent to you for your consideration of this matter and decision pursuant to the University Policy on Misconduct in Science (#00-01-20-60:00).

Enclosure

June 21, 2001

**REPORT OF INITIAL INQUIRY INTO ALLEGATIONS OF
POTENTIAL MISCONDUCT IN SCIENCE AGAINST ANUPAM BISHAYEE, PH.D.**

In accordance with the University Policy on Misconduct in Science (#00-01-20-60:00) (Appendix A), the Newark Campus Committee on Research Integrity is constituted to receive reports or allegations of misconduct in science and conduct initial inquiries for the Newark Campus.

Current members of the Committee were nominated by their Deans and appointed by the Senior Vice President for Academic Affairs. Committee membership is as follows: Anthony V. Boccabella, Ph.D., J.D., Professor, Department of Anatomy, Cell Biology & Injury Sciences, UMDNJ-New Jersey Medical School (representing UMDNJ-Graduate School of Biomedical Sciences); Neil Cherniack, M.D., Professor, Departments of Medicine and Pharmacology & Physiology, UMDNJ-New Jersey Medical School; Daniel Fine, D.D.S., Professor, Department of Oral Pathology, Biology & Diagnostic Sciences, UMDNJ-New Jersey Dental School; Anthony Forrester, Ph.D., R.N., Professor, UMDNJ-School of Nursing; Teresa Marsico, M.Ed., C.N.M., UMDNJ-School of Health Related Professions; and Elizabeth Raveché, Ph.D., Professor, Department of Pathology & Laboratory Medicine, UMDNJ-New Jersey Medical School (Chair of the Committee). Dr. Boccabella did not participate in the proceedings because he was absent during the first meeting and therefore was excused from the remaining meetings.

In the following report, asterisks () denote that pertinent documents are to be found in the attachments to the minutes of the Committee's meetings which are in Appendix C of this report.*

CHRONOLOGY OF ACTIVITIES

On April 9, 2001, Dr. Stephen Baker, Chair of Radiology at UMDNJ-New Jersey Medical School, informed Dr. Elizabeth Raveché, Chair of the Newark Campus Committee on Research Integrity, that Dr. Helene Z. Hill, Professor in the Department of Radiology, suspected a Research Associate, Anupam Bishayee, Ph.D. of possible research misconduct in research conducted under NIH Grant RO1#CA83838. Dr. Roger Howell,

Associate Professor in the Department of Radiology, is P.I. on this grant. Dr. Raveché indicated to Dr. Baker that the complainant, Dr. Hill, would need to contact her directly in order to make a formal allegation of scientific misconduct.

On the following day, April 10, 2001, Dr. Raveché met with Dr. Hill who was accompanied by Dr. Howell. In that meeting, Dr. Hill alleged that Dr. Bishayee had fabricated and/or falsified and/or plagiarized data during two experiments. The first experiment took place in September/October 1999 and involved survivability and mutagenicity following irradiation of mammalian V79 cells with the mutant gene HPRT. The second experiment took place during March 26-30, 2001 and was concerned with the "bystander" effect of radioactive mammalian cells. These experiments and details of Dr. Hill's allegations concerning them are described in the following sections of the report, as well as in the attachments to the Committee meeting minutes (Appendix C).

Following this meeting with Dr. Hill on April 10, 2001, Dr. Raveché sequestered the original data in question on the same day. With the assistance of Dr. Howell, the pertinent materials were identified and removed from his laboratory to Dr. Raveché's office, including 32 binders, 4 notebooks, 46 diskettes, 7 zip disks and 38 petri dishes, the latter from Dr. Bishayee's March 26-30, 2001 experiment. In addition, Dr. Hill gave Dr. Raveché a binder containing her written allegations which consisted of narratives, diaries, photographs, copies of Dr. Bishayee's original data from his lab book, Dr. Hill's original data from similar experiments, and the experimental protocol(*).

The Newark Campus Committee on Research Integrity was convened the next day, April 11, 2001, and performed a preliminary assessment of the allegations. The Committee considered Dr. Hill's oral statements to Dr. Raveché of April 10, 2001 as related by Dr. Raveché, as well as Dr. Hill's written allegations, copies of which were distributed to the Committee(*). The Committee voted unanimously that (1) the allegations met the definition of misconduct in science under PHS regulations and University policy; and (2) there was adequate information for an initial inquiry to proceed. The Committee immediately commenced the initial inquiry, the official start date of which was therefore April 11, 2001.

The Committee first discussed whether any of its members had a conflict of interest or bias as described in the University policy, Section V.D.3. Each member stated that he or she did not have such conflict of interest or bias and therefore would remain on the Committee for the initial inquiry. Dr. Raveché was requested to prepare formal written notifications of

the commencement of an initial inquiry to the respondent, Dr. Bishayee, the complainant, Dr. Hill, Dr. Russell Joffe, Dean of UMDNJ-New Jersey Medical School, and Dr. Karen Putterman, Vice President for Academic Affairs, UMDNJ, pursuant to University policy (Appendix B). The Committee then reviewed the six circumstances under which the ORI must be immediately notified of an allegation of misconduct in science, as set forth in the University policy Section V.H. The Committee decided that none of these conditions pertained to the current case and therefore ORI did not need to be notified at this time.

The Committee decided which individuals it would interview at its next meetings and which additional materials it would review. The individuals to be interviewed were Dr. Hill, Dr. Bishayee, Dr. Howell and Dr. Marek Lenarczyk, a postdoctoral fellow working for Dr. Howell who, according to Dr. Hill, helped her observe and investigate Dr. Bishayee's March 26-30, 2001 experiment by taking photographs, culturing Dr. Bishayee's experimental materials for contamination, and testing these materials for radioactivity. The additional materials that were gathered and reviewed by the Committee included the grant in question, all publications on which the grant was based, all publications appearing subsequent to receipt of the grant which reported on data developed under the grant, all abstracts pending presentation, and the CVs of Drs. Bishayee, Hill and Howell.

The Committee met again on April 17, 2001 to interview Dr. Hill, the complainant. On April 27, 2001 the Committee interviewed Dr. Howell, Dr. Bishayee, and Dr. Lenarczyk. The Committee met to discuss the evidence and testimony on May 9, 2001. The Committee met for the last time on June 7, 2001 to consider additional comments submitted by Dr. Hill to Dr. Raveché on May 22, 2001 during a private meeting with her, and to interview Dr. Bishayee a second time. The Committee finalized its conclusions and recommendations at its June 7, 2001 meeting.

The minutes of all Committee meetings are in Appendix C.

DESCRIPTION OF SEPTEMBER/OCTOBER 1999 EXPERIMENT AND ALLEGATION

This experiment used V79 HPRT mutant cells and investigated their survivability and mutagenicity following irradiation using the "Banbury protocol" as published in Mammalian Cell Mutagenesis, Banbury Report No. 28, M.M. Moore et al., editors, 1987. There are two arms to these experiments, a survival arm followed by a mutagenesis arm. During Dr. Hill's interview with the Committee on April 17, 2001, she reported that on September 6, 1999,

Dr. Bishayee began one such experiment jointly with Dr. Hill, with Dr. Bishayee performing the survival part and Dr. Hill the mutagenesis part. Dr. Hill went on to say that on September 20, 1999, Dr. Bishayee initiated another one of these experiments, this time doing both parts himself. She described her concerns about the mutagenicity part of Dr. Bishayee's September 20, 1999 experiment. Dr. Hill explained that on October 11, 1999, following ten days of incubation, the plated cells were ready to be fixed and stained and the colonies counted. Dr. Hill said Dr. Bishayee told her he was going to stain the plates that day (October 11). The next day, October 12, 1999, Dr. Hill said she became suspicious when she found a set of dishes of the number and type that would be used under this protocol still in the incubator. She said she examined the plates under a microscope, and found no colonies or even dead cells which she said would be expected in this type of experiment. Dr. Hill reported that she had questioned Dr. Bishayee on October 13, 1999 about these dishes she found in the incubator, and he had told her they were for a different experiment. However according to Dr. Hill, the P.I., Dr. Howell, later told Dr. Hill that there was no other experiment going on in the lab at that time that used this kind of dish. Dr. Hill also said that on October 14, 1999, the day after she questioned Dr. Bishayee about the dishes and what experiment they were for, the dishes disappeared from the lab and she could not find them in the trash. Dr. Hill concluded from these occurrences that Dr. Bishayee had fabricated the mutation data from this experiment, or that he may have plagiarized the experimental results from the Banbury publication that had also disappeared from the laboratory at the same time.

Following Dr. Hill's interview with the Committee on April 17, 2001, a copy of the Banbury publication was obtained from the library and shown to Dr. Hill on April 26, 2001 by Dr. Sheila Eder, Director of Institutional Research in the UMDNJ Office of Academic Affairs. Dr. Hill reviewed it in Dr. Eder's presence and stated she could not find any data that Dr. Bishayee had plagiarized(*).

Dr. Hill told the Committee she reported her suspicions to Dr. Howell shortly after her observations about Dr. Bishayee's September/October 1999 V79 mutant experiment. She said that Dr. Howell did not believe her. She did not take the issue further because, she stated to the Committee, she was not "absolutely certain" she was correct since she was unfamiliar with and had difficulty using the particular microscope with which she examined the dishes in question. In her April 17, 2001 interview with the Committee, Dr. Hill also said that Dr. Bishayee might have been merely sloppy rather than dishonest.

On May 22, 2001, Dr. Hill met with Dr. Raveché separately to provide the Committee with additional comments about this experiment(*). At that time, she told Dr. Raveché she went back and reviewed Dr. Bishayee's survival data, including the Coulter cell counts of September 24 and 27, and October 1 and 4, 1999, and graphed his survival and mutagenicity results. Dr. Hill told Dr. Raveché that she believed his Coulter counts after irradiation do not show the expected difference between the controls and the irradiated cells, i.e., the irradiated cells should be expected to have lower counts than the controls due to cell death or damage from the irradiation making it impossible for the cells to divide normally. Dr. Hill showed Dr. Raveché her own data from the same protocol she had carried out on September 6, 1999 which she said do show this difference(*). Dr. Hill concluded that, with these Coulter readings three days after irradiation, Dr. Bishayee could not have gotten the experimental results he did, which appear to be valid and as predicted for this experiment.

At its meeting of June 7, 2001, the Committee reviewed both Dr. Hill's testimony of April 17, 2001 concerning this experiment and her additional comments discussed with Dr. Raveché on May 22, 2001. The Committee reviewed the steps in the protocol that was followed by Drs. Hill and Bishayee in September/October 1999 and the specific techniques involved. They noted that high variability in counting cells using Coulter methodology is the norm, and that Coulter counts can be thrown off by technical flaws such as failure to adequately disperse the cells, the presence of bubbles, etc. The Committee also noted the fact that the Coulter counts are not integral to the experiment in question, but are incidental data not analyzed or used in the results; they are used only as a guide to determine how to dilute the cells to get the correct number of cells for the next step and to determine when the cells had undergone a total of ten divisions. The Committee did agree, however, that the pattern of Coulter counts in Dr. Bishayee's experiment showed inconsistent effects of irradiation compared to the non-irradiated controls.

Therefore the Committee interviewed Dr. Bishayee a second time on June 7, 2001 concerning his September/October 1999 experiment. Dr. Bishayee explained that plating for survival is done on day zero of exposure (irradiation) and the plates are read seven days later. In his running of the experiment, Dr. Bishayee stated that September 24, 1999 was day zero (day of irradiation). Dr. Bishayee confirmed this by pointing to his records in his notebook(*). Therefore the Coulter counts on September 24, 1999 would not be expected to show any significant difference between controls and irradiated tubes. Dr. Bishayee reviewed with the Committee the Coulter counts for September 27, 1999, the

actual day three, at which time such differences might be present. He and the Committee noted that except for tubes five and ten whose counts appear too high for the highest radiation-dose tubes, the expected difference in counts was in fact observed (tubes three and four had lower counts than tubes one and two, and tubes eight and nine lower than tubes six and seven). The Committee agreed with Dr. Bishayee that the counts in tubes five and ten, although not fitting the expected pattern, were within experimental error. In addition, Dr. Bishayee explained to the Committee why even on day three one might not necessarily see survival effects of irradiation (because, for example, cell death or damage might not occur right away but be delayed and appear later in an exponential fashion). Survival effects are known to occur for sure by day seven which is why the plates prepared on day zero are read seven days later for survival.

The Committee was satisfied with Dr. Bishayee's explanation of his running of this protocol and the data he had recorded in September/October 1999.

DESCRIPTION OF MARCH 26-30, 2001 EXPERIMENT AND ALLEGATION

This was one of a series of experiments on the bystander effect of radioactive thymidine incorporation into mammalian cells performed under Dr. Howell's NIH grant RO1#CA83838. At the time of these experiments, Dr. Lenarczyk had joined Dr. Howell's lab as of April 2000.

Dr. Hill stated to the Committee at her interview on April 17, 2001 that Dr. Lenarczyk told her he had also become suspicious of Dr. Bishayee's work, and she had shared with him her concerns about the September/October 1999 experiment. This led to their teaming up to observe and investigate the experiment conducted by Dr. Bishayee from March 26, 2001 through March 30, 2001. Their investigations of Dr. Bishayee's experiment were without his knowledge and were also kept secret from Dr. Howell. Drs. Hill and Lenarczyk secretly tested Dr. Bishayee's incubating test tubes for bacterial or yeast contamination, and attempted to monitor the number and location of the test tubes during the experiment, documenting and photographing their findings. Following is a description of the activities of Drs. Hill and Lenarczyk and their conclusions.

Dr. Hill told the Committee that Dr. Lenarczyk, working near Dr. Bishayee at the beginning of his March 26-30, 2001 experiment, had told her he thought that Dr. Bishayee's two cell culture T175 flasks were contaminated based on visual inspection of them (cloudiness).

Dr. Hill and Dr. Lenarczyk subsequently recovered Dr. Bishayee's flasks from the trash and photographed them to show contamination. Dr. Hill submitted as evidence to the Committee photographs she said were Dr. Bishayee's flasks(*). According to Dr. Hill, Dr. Lenarczyk also told her that despite this contamination, he saw Dr. Bishayee proceed with his experiment using cells from one of the T175 flasks which Dr. Lenarczyk had observed to be contaminated. Dr. Hill told the Committee that this behavior by Dr. Bishayee would call into question the validity of any of his experimental results.

The Committee asked Dr. Hill how she could know that the cells from these flasks were really contaminated and, if so, were actually used by Dr. Bishayee for his experiment. Dr. Hill responded that that was her hypothesis. Dr. Raveché asked Dr. Hill for the evidence that Dr. Bishayee's experiment was contaminated since gross contamination could not be observed in helena tubes. In particular, Dr. Raveché asked when she had observed Dr. Bishayee's two allegedly contaminated T175 flasks in the 37 degree incubator. Dr. Hill responded that the two T175 flasks were in the 37 degree incubator on Wednesday, March 28, 2001 rather than the one flask that would have been expected to remain following initiation of the experiment. Dr. Hill indicated that to her this meant that Dr. Bishayee split and reseeded the material from the single T175 flask to make the two T175 flasks observed on Wednesday, March 28. It remained unclear to the Committee, even after several specific questions about this to Dr. Hill, exactly when she had observed Dr. Bishayee's single T175 flask to be contaminated. Dr. Hill also stated that Dr. Bishayee asked Dr. Lenarczyk for cells on Thursday night, March 29, 2001. Dr. Hill believes that Dr. Bishayee substituted the cells he received from Dr. Lenarczyk on March 29 in his own experiment.

Dr. Hill continued her testimony to the Committee by stating that she and Dr. Lenarczyk began to secretly monitor and photograph Dr. Bishayee's experiment after they suspected he had proceeded using contaminated material. Their photographs of helena tubes in the 10.5 degree incubator, which they believed to be those of Dr. Bishayee's experiment, were also submitted to the Committee(*).

During these secret observations, Dr. Hill said she noticed that six of the original seven tubes were not removed from the 10.5 degree incubator on the day she believed Dr. Bishayee had supposedly harvested his cells. Dr. Hill said she found the seventh tube, which would have contained radioactive substances, empty in the non-radioactive trash in the lab. Drs. Hill and Lenarczyk tested the tubes they found remaining in the 10.5 degree

incubator for radioactivity, and concluded that Dr. Bishayee had used the contents of the discarded seventh tube to add radioactive aliquots to the other six tubes that were then measured in the FACS laboratory. Dr. Hill explained to the Committee how Dr. Bishayee might have achieved his experimental results from a single aliquot from tube #7, the missing tube. However Drs. Hill and Lenarczyk did not test the discarded seventh tube for radioactivity.

Dr. Hill stated that she and Dr. Lenarczyk, acting on the hypothesis that Dr. Bishayee had used contaminated cells for the March 26, 2001 experiment, secretly sampled the material from Dr. Bishayee's helena tubes later on during his experiment, cultured the samples on sterile media, and grew bacteria. In addition to sampling Dr. Bishayee's tubes for contamination, Drs. Hill and Lenarczyk also sampled for radioactivity cells from all of Dr. Bishayee's tubes remaining in the 10.5 degree incubator. All the tubes subsequently disappeared from the lab after Dr. Bishayee was told Drs. Hill and Lenarczyk were watching him, and Dr. Hill could not find them anywhere, even in the trash.

The photographs presented to the Committee showed helena tubes in a radioactive-labeled rack in an incubator with numbered labels but no investigator name. Some of the photographs were taken with a digital camera indicating a date(*).

On Friday, March 30, 2001, Dr. Hill believed Dr. Bishayee sorted samples that he got from Dr. Lenarczyk and not from the material original to the experiment, which was instead left in the 10.5 degree incubator.

From these secret investigations, Dr. Hill told the Committee she concluded that Dr. Bishayee fabricated and/or falsified the data from this experiment because he could not have obtained any valid results otherwise under the circumstances in which the experiment was observed by Drs. Hill and Lenarczyk to have been conducted (presumably contaminated original culture flasks, helena tubes left in the incubator after they were supposed to have been harvested, the seventh tube missing from the incubator and found in the trash, the complete disappearance of all tubes after Dr. Bishayee was alerted, Dr. Bishayee asking Dr. Lenarczyk for fresh cultures on March 29).

The Committee asked Dr. Hill how Dr. Bishayee could have gotten any results from his experiment if Dr. Hill's hypothesis about Dr. Bishayee was correct. Dr. Hill believes that Dr. Bishayee could have figured out how many cells to plate of those he received from Dr.

Lenarczyk on March 29, 2001 in order to get 1 percent survival, the expected result. The Committee noted that any such effort on Dr. Bishayee's part to fabricate the experimental results in this experiment would have been greater than simply repeating the experiment with fresh, uncontaminated cells.

The Committee interviewed Dr. Lenarczyk on April 27, 2001 about the March 26-30, 2001 experiment. Dr. Lenarczyk stated that the experiments measuring cell survival rates cannot be validly completed if carried out with contaminated cell material. In the case of the experiment started by Dr. Bishayee on Monday, March 26, 2001, Dr. Lenarczyk believes that Dr. Bishayee had used contaminated cells.

Dr. Lenarczyk explained to the Committee that by Friday, March 30, 2001, he was sure that the experiment was contaminated. Since he had no reason to check on Dr. Bishayee's cells before that, he couldn't say for certain that the experiment was begun with contaminated material. But on Friday, March 30, 2001, Dr. Lenarczyk observed that Dr. Bishayee's cells were still in helena tubes in the 10.5 degree incubator when, according to the protocol, they should have been taken out by that time. In addition, Dr. Lenarczyk said that Dr. Bishayee had asked Dr. Lenarczyk for new cells on Thursday, March 29, 2001, and that this aroused his suspicions because of the long-standing problem of contamination in the lab which he ascribed to Dr. Bishayee's poor technique. He wondered why Dr. Bishayee was asking for cells on Thursday, when the cells for the experiment should be removed from the tubes on Friday. When the Committee asked whether Dr. Bishayee might not have been following a different protocol, Dr. Lenarczyk answered that he thought the fact that the cells were in helena tubes indicated that the experiment was looking for bystander effect and was using that protocol.

Dr. Lenarczyk went on to say that when he went to the 10.5 degree incubator on Friday, March 30, 2001, to remove his own tubes, he observed Dr. Bishayee's tubes still there with one tube missing. He had seen earlier in the week that Dr. Bishayee had started with seven tubes, the expected number, in the 10.5 degree incubator. Dr. Lenarczyk said he had seen Dr. Bishayee sitting in the hood on Friday morning, March 30, 2001 at 10 or 11 a.m. While he didn't check what Dr. Bishayee was doing, he assumed that he was processing cells from that week's experiment.

Dr. Lenarczyk began to think that "something was going wrong" and took samples of the tubes remaining in the 10.5 degree incubator. Dr. Lenarczyk stated that he sampled the tubes on Friday, March 30, 2001 because he believed Dr. Bishayee had already concluded the experiment when he saw him working in the hood that morning.

The Committee asked why Dr. Lenarczyk didn't ask Dr. Bishayee about what was going on. Dr. Lenarczyk replied that he chose not to speak to Dr. Bishayee, but to talk to Dr. Hill since he was living in her house.

The Committee asked Dr. Lenarczyk when it was that he started taking pictures. Dr. Lenarczyk responded that he didn't remember. Dr. Lenarczyk said that the camera was new and he had to learn how to set it to record dates. Therefore not all the photographs submitted to the Committee were dated.

The Committee was concerned with inconsistencies in Dr. Lenarczyk's remarks concerning the dates the photographs were taken and the manipulation during the experiment of the tubes purported to be those of Dr. Bishayee by Drs. Hill and Lenarczyk.

The Committee was also concerned that actions by Dr. Hill and Dr. Lenarczyk may have interfered with Dr. Bishayee's experiment. If cultures from the sampled 6 tubes were allowed to grow for a day to prove contamination, then the samples must have been drawn by Drs. Hill and Lenarczyk on Thursday, March 29, 2001. If so, this seems like it would have interfered with Dr. Bishayee's experiment. Dr. Lenarczyk said that he might have taken samples that Thursday, but was not sure.

The Committee wondered whether there could have been scientific misconduct if Dr. Bishayee had used contaminated cells but then admitted to a contamination problem by reporting in his lab book that half of the petri dishes were contaminated and half were not. (The petri dishes were in the Committee's possession and demonstrate this pattern of contamination reported by Dr. Bishayee in his lab book.) The Committee asked Dr. Lenarczyk if he was aware of Dr. Bishayee's recorded results, and he responded that he never saw the results. The Committee considered whether there could be alternative explanations for the presence of the tubes in the 10.5 degree incubator on Friday, March 30, 2001, including that these tubes might have been from a different experiment.

The Committee interviewed Dr. Bishayee on April 27, 2001 about his March 26-30, 2001 experiment. Dr. Bishayee told the Committee that this experiment was only partly successful in that half the plates were lost to contamination. However he denied that he knew that his original cultures in the T175 flasks were contaminated at the time the experiment was initiated. He described the course of the experiment, and said he had removed his tubes from the 10.5 degree incubator on March 30, 2001. Dr. Bishayee also informed the Committee that he had been conducting tests at the same time of a new cell line to observe its growth and cluster size characteristics prior to beginning bystander experiments with it. He also placed these tubes in the 10.5 degree incubator sometime during March 26 to March 30, 2001, but did not have consistent recollections of exactly when or how many tubes there were, or when he discarded them, and he did not make notes in his lab book of his observations of the new cell line. Dr. Bishayee explained that he did not record his observations of the new cell line because he was not collecting data on it but rather just physically observing the cells for their growth characteristics.

The Committee showed Dr. Bishayee during his first interview the photographs Dr. Hill and Dr. Lenarczyk had secretly taken of helena tubes in the 10.5 degree incubator(*). Dr. Bishayee said he thought the tubes in the photographs were his because he thought he recognized the numbering on the tubes' labels. However he could not explain why there were only six tubes in the rack, when the photos could have been taken, or why the racks changed in location within the incubator from one photo to the next. Dr. Bishayee denied ever removing only one tube from the rack during this experiment. Dr. Bishayee also did not remember why he had asked Dr. Lenarczyk for new cells on March 29, 2001, but denied using these new cells for the sorting on March 30, 2001. He pointed out to the Committee that investigators often ask colleagues within their labs for cells, and there was nothing unusual in his request to Dr. Lenarczyk.

Dr. Bishayee told the Committee that he felt he was the victim of a conspiracy against him, that these allegations could be the result of jealousy, and that he had had "problems" with Dr. Hill over the past two years because, he believed, Dr. Howell did not want to incorporate Dr. Hill's work into his grant. He also described fights with Dr. Lenarczyk and a conflict of interest on Dr. Lenarczyk's part stemming from his living in Dr. Hill's house which created an obligation to her.

The Committee interviewed Dr. Howell about these experiments on the same day, April 27, 2001. Dr. Howell said that there were certain details of the experiment that neither Dr. Hill nor Dr. Lenarczyk would have known. According to Dr. Howell, Dr. Hill and Dr. Lenarczyk believed that both populations of cells (radioactive and bystander) at the point of plating were contaminated because they thought all Dr. Bishayee's original cultures were contaminated at the start of his experiment. However, this would be hard to know from looking at the contents of the helena tubes because these were incubated in the cold (at 10.5 degrees), under which conditions bacterial and cell growth is minimal. Contamination would not be known for sure until after the seven days of growth in petri dishes at 37 degrees. In fact, while the plated petri dishes of dyed (irradiated) cells were found to be contaminated after seven days and could not be counted, the undyed (bystander) plated cells grew and were in fact counted in Dr. Howell's presence.

The Committee asked Dr. Howell how he could be sure of the origin of the cells plated in the petri dishes, and whether something improper could have been done to get the end results. Dr. Howell responded that this was possible, but if someone were going to improperly manipulate experimental material, he or she would not falsify the "wrong" population of cells. He went on to explain that each experiment focuses on either the radioactive dyed cells or the bystander undyed cells. The amount of radioactivity used varies according to the focus of the experiment. The experiment in question focused on the radioactive cells which was different from previous experiments. Drs. Hill and Lenarczyk were unaware of this change in focus. Dr. Howell said it would make no sense for Dr. Bishayee to substitute new uncontaminated cells for the non-radioactive cells because they were not the focus of the experiment.

Dr. Raveché told Dr. Howell that Dr. Hill had said that Dr. Bishayee's experiment was contaminated and that Dr. Bishayee knew that already on Friday, March 30, 2001. Dr. Howell responded that Dr. Bishayee would have no way of knowing that just from observing the helena tubes; the only way would have been if he had plated the cells at the beginning of the experiment.

When Dr. Howell was asked for his comments about the sampling of the tubes by Dr. Lenarczyk during Dr. Bishayee's experiment, he responded that he didn't understand why Drs. Hill and Lenarczyk didn't confront Dr. Bishayee directly with their questions about his experiment.

Dr. Howell also had no explanation for the Committee as to why Dr. Bishayee would have allegedly left the tubes in the 10.5 degree incubator after they were supposed to have been removed for the conclusion of the experiment.

In an attempt to account for there being only 6 tubes in the 10.5 degree incubator, Dr. Howell stated that they could have been the new cell line tubes that Dr. Bishayee was testing at the same time as his bystander experiment. However the rack shown in the photographs had a radioactive label.

Dr. Howell stated that Dr. Bishayee had a good record of producing work, that Dr. Hill had not produced original research in years, and that Dr. Lenarczyk has been non-productive in his 9 months as a postdoctoral fellow. Dr. Howell noted that this experimental protocol is very difficult and there is pressure to publish. There are a number of steps that are prone to contamination. Dr. Howell told the Committee that Dr. Bishayee had "one complete, two failed and one half-contaminated" experiment under this protocol.

Dr. Raveché asked if Dr. Howell could explain the surprising fact that only half the experimental tubes were contaminated following plating. Dr. Howell stated that it could have had something to do with the dye. He knew that the dye was sterile but the phosphate buffer used with the dye could have been contaminated. After 30 minutes in the dye, the cells are washed, mixed with the unlabeled cells and then chilled. The bacteria would remain dormant and not infect the unlabeled cells.

The Committee asked Dr. Howell to comment on the same set of photographs reviewed by Dr. Bishayee(*), and to respond to the observations made by Drs. Hill and Lenarczyk about Dr. Bishayee's experiment. Dr. Howell had no explanation for the photographs nor for Drs. Hill's and Lenarczyk's stated observations of Dr. Bishayee's experiment.

Following its interviews with Drs. Hills, Lenarczyk, Bishayee and Howell concerning Dr. Bishayee's March 26-30, 2001 bystander effect experiment, the Committee found no apparent explanation to account for the photographs if they were taken as and when stated by Dr. Hill, and if Dr. Bishayee's testimony about his conduct of the experiment was truthful. No other evidence was available to either prove or disprove Dr. Bishayee's statements or confirm the validity of the photographs.

CONCLUSIONS AND RECOMMENDATIONS

On May 9, 2001 and again in June 7, 2001, the Committee reviewed the evidence and the interviews, and unanimously voted that there was insufficient credible and definitive evidence of misconduct in science to warrant further investigation. This conclusion was based upon the following considerations:

- With regard to Dr. Hill's allegation of falsification/fabrication/plagiarism by Dr. Bishayee in his September/October 1999 experiment under the "Banbury protocol," the Committee found insufficient evidence to substantiate this allegation from its examination of Dr. Bishayee's notebooks(*), from Dr. Hill's testimony about her observations of unlabeled plates she found in the incubator, and from her statements following her review of the published data in Banbury Report No. 28(*). The Committee was also satisfied with Dr. Bishayee's explanation of his September/October 1999 experiment with regard to the pattern of Coulter counts and their relevance to the successful running of the experiment.
- With regard to Dr. Hill's allegation of falsification/fabrication by Dr. Bishayee in his March, 2001 bystander experiment, the major physical evidence was the photographs taken by Drs. Hill and Lenarczyk(*). These photographs could not be dated definitively and could not be related definitively to the experiment that Dr. Bishayee said he performed from March 26-30, 2001. There was insufficient evidence to reconcile the purported date of the photographs and what Dr. Hill believed they demonstrate about Dr. Bishayee's experiment of March 2001 with the testimony of Dr. Bishayee that he conducted the experiment as recorded in his lab book and obtained the results as recorded therein(*). Therefore the Committee was unconvinced that the photographs credibly proved that the experiment Dr. Bishayee actually carried out was different from that recorded in his lab book.
- The evidence that Dr. Bishayee's March 26-30, 2001 experimental materials were contaminated from the inception of his experiment was insufficiently credible to support the complainant's contention that Dr. Bishayee could not have obtained the data he recorded from the experiment he actually carried out.

- The testimony of the complainant, Dr. Hill, conflicted with that of Dr. Lenarczyk as to dates, their observations of Dr. Bishayee's helena tubes, and what they did when with Dr. Bishayee's experimental materials in their attempt to collect evidence of misconduct in the March 26-30, 2001 experiment.
- Dr. Hill and Dr. Lenarczyk admitted to tampering with Dr. Bishayee's March 26-30, 2001 experiment, possibly before it was completed.
- Although the Committee discussed possible motivations for Dr. Bishayee's alleged actions, it could discern no reason for Dr. Bishayee's falsification, fabrication or plagiarism of the data for his experiments of September/October 1999 or of March 26-30, 2001.

After hearing all the testimony, the Committee was very concerned that serious problems regarding interpersonal relationships, communication and oversight of research existed in Dr. Howell's lab. Therefore, the Committee voted unanimously to recommend that the Senior Vice President for Academic Affairs ask Dr. Howell to take corrective actions to improve the conduct of research and the environment in his lab.