

## Correspondence

### Are Anesthesiologists Immunostimulated?

*To the Editor:*—Although his own data (Immunologically Competent Anesthesiologists," ANESTHESIOLOGY 37:76-78, 1972) suggest enhanced PHA-stimulated lymphocyte reactivity (as measured by tritiated thymidine incorporation) of anesthesiologists compared with normal controls, Dr. Bruce states that "most likely . . . the anesthesiologists studied were normally immunoreactive using this method to assay this capacity." Furthermore, he states that considering the "depression of PHA stimulation in patients receiving 6-mercaptopurine, methotrexate, and prednisolone . . . any enhancement of the response must be considered of questionable significance." Actually, there is evidence that low doses of certain so-called immunosuppressant drugs may be immune stimulants. For example, low-dose 6-mercaptopurine increases  $\gamma$  G,  $\gamma$  M, and total protein production of PHA-stimulated lymphocytes of both normal and leukemic individuals,<sup>1</sup> although the mechanism does not seem to involve new DNA synthesis.<sup>2</sup> Thus, it seems possible that the low doses of anesthetics that anesthesiologists are exposed to are acting as immune stimulants rather than as immunosuppressants as when given in anesthetic concentrations. Furthermore, despite the increased incidence of cancer in patients

taking immunosuppressive drugs, the exact processes by which normal immune systems function to suppress tumor appearance are still unknown.<sup>3</sup> It has been seriously suggested from human and animal data that immune stimulation might actually accelerate the neoplastic process, perhaps by the formation of antibodies that block existing host immunity.<sup>4</sup>

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#### REFERENCES

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2. Goldsmith M: Personal communication
3. Fahey JL: Editorial: Cancer in the immunosuppressed patient. Ann Intern Med 75:310-312, 1971
4. Bornstein JW, Yarbo JW, Prehn RT: Editorial: Immunotherapy: The need for critical studies. Ann Intern Med 76:499-501, 1972

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### Correction of Minor Statistical Errors

*To the Editor:*—May I draw attention to two minor errors in the statistical treatment of the data in "Effects of Dry Anesthetic Gases on Tracheobronchial Ciliated Epithelia," by Chalon, Loew, and Malebranche (ANESTHESIOLOGY 37:338-343, 1972). They represent a common misunderstanding of the difference between enumerative data, represented in the paper by counts of cytologic criteria, and commensurate data represented by continuous variables. The chi-square test is the prototype for analysis of the former, while "Student's *t*" assumes continuous variables normally distributed.

The error in table 1 may be considered minor, because large numbers of multivariates tend to be normally distributed. However,

scores are clearly enumerative in character, and proper rigorous treatment demands the appropriate analysis, rather than the *t* test used.

The second error lies in the use of an assumption of normally distributed continuously variable data in calculating mean standard deviation of percentages, represented in table 2. Even with continuous variables, statistics are properly calculated from data, not from indices.

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