Letter to the Editor

In Diagnostic Laboratory Immunology the Robot Still Needs Some Careful Human Guidance

Total laboratory automation (TLA) is coming to have a larger place in one of the remaining bastions of manual, cerebral clinical testing—diagnostic laboratory immunology (DLI). That is the message of R. Tomar’s commentary (1). How far should the automation go, and what effect will this have on DLI, other than the obvious reduction of skilled technological personnel with the rise in computer technicians and data managers?

There has always been a certain aesthetic beauty to DLI that is less prominent in other diagnostic laboratory specialties. The goal of DLI is to assess the immune system, its integrity, its qualitative and quantitative function and dysfunction, and its state of activation reflecting disease or immunomodulatory drug activity. DLI is the key support of any hospital-based clinical immunology division.

We are in the infancy of knowing the best way of assessing immune system activation and modulation. Many of our current methods of assessing immune integrity may be improved upon. Immune evaluation often calls for tailoring the assessment tests used for individual patients: which aspects need to be examined—cellular, humoral, or mediator-amplifier components?

There are problems of TLA in DLI, as mentioned in the commentary. The borderline value coming from a black box automation kit can hardly influence clinical decision making, in a field where the laboratory assessment should be able to direct treatment decisions and directions. The DLI specialist does better here than a technology that simply allows one to generate a lot of values. Really satisfactory DLI assessment of the future may be as much a reflection of learning the correct timing and processing of clinical specimens as simply having the technology to give a printout value. We will continue to have mainly serum and cells from the blood for the desired assessments of the immune system. There is still a major place for the aesthetics of planning and executing meaningful immune assessment. The commentary raised serious questions of whether this can be done as part of TLA or if DLI still requires more of a scientific brain and skills.

REFERENCE
1. Tomar, R. 1999. Total laboratory automation and diagnostic immunology. Clin. Diagn. Lab. Immunol. 6:293–294.

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Author’s Reply

Dr. Osterland has concerns that machines will produce numbers, lots of numbers, with little or no consideration of the need for generating those numbers. While an increase in automation could lead to an increase in inappropriate determinations, “it ain’t necessarily so.” Moreover, there are centers already performing laboratory testing with little regard for its need. Few of these laboratories are totally automated. Automation need not and should not replace the selection and sequence of testing; it need not and should not replace the interpretation of those assays. However, automation will continue to replace manual performance of tests.

The challenge for laboratorians will be to compete for the authority to control the “cerebral” functions associated with clinical measurements. There will be pressure from administrators, instrument and reagent sales representatives, governmental regulators, and perhaps even our clinical colleagues to replace medical decision making with cost controls, i.e., the machines are doing the work and we do not need highly trained people on the dole. An uninformed public may find this a compelling argument for reducing or even eliminating clinical judgment from the laboratory. I am concerned that laboratorians will respond to such pressure by hiding from or obstructing all new ventures.

The laboratorian, in addition to providing information to clinical colleagues, will need to assume other roles such as that of ombudsman for quality patient care and educator to the public for the public good. While there is no substitute for astute local politicking, I suspect that the laboratorian’s agenda will be most effectively accomplished through responsive, highly motivated, well-respected, well-funded, well-crafted national organizations.

Total laboratory automation presents another tool and another opportunity to improve the quality of health care. It has the potential of controlling costs. It opens up new avenues for research as well as educational and experiential growth. However, like most tools, it is one that must be utilized with care and concern.

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