

Letter from the Editors

We are indebted to Drs. Abass Alavi and to Christopher Palestro for their invaluable suggestions for the contributions included in the January and March issues of *Seminars in Nuclear Medicine*, which are devoted to nuclear medicine and infectious disease. The area discussed is one of emerging importance in nuclear medicine. The role of infection in clinical medicine is among the top priorities of therapeutic research. With the emergence of the antibiotic era, after the discovery of penicillin in 1928 and its clinical validation in 1943, the initial optimism that infectious disease would go away has failed to be realized. Numerous problems continue to occur with the result that infectious disease continues to be a major cause of disability and death in the world. Nearly 15 million of the 57 million deaths per year worldwide are attributed to infectious disease. Further insight into this problem can be gained from a review of the National Institutes of Health position statement on infectious disease (<http://www.medscape.com/viewarticle/501856>). Drug-resistant strains of tuberculosis, malaria, and many other infectious agents continue to emerge. As a result, this area remains a high priority in research to determine both therapeutic approaches to these resistant diseases and to determine better and more efficient ways to diagnose them as early as possible to increase the likelihood of eradication.

Stanley Goldsmith and Shankar Vallabhajosula have written a very revealing review of the clinically available radiolabeled agents for infection that have been well studied. Although an enormous amount of effort has gone into developing new radiopharmaceuticals, the basic armamentarium of radioactive gallium and radiolabeled leukocytes remain the dominant diagnostic agents for clarifying potential infection. Most recently, ^{18}F -fluorodeoxyglucose positron emission tomography (PET) has begun to emerge as another potential approach, which has the advantage of high-resolution PET imaging to facilitate the possibility of more accurate diagnosis.

Complementing Drs. Goldsmith and Vallabhajosula's article is the review by Drs. Gemmel, Dumarey, and Welling, which looks at future diagnostic agents. These include antibodies, antibody fragments, cytokines, and a number of other promising infection specific radiopharmaceuticals. None of these has yet replaced the basic agents available, but the amount of work being performed and the wide variety of potential alternative approaches is extremely encouraging. Having reviewed the radiopharmaceuticals present and future, it seems appropriate

then to direct our attention to the article by Drs. Stumpe and Strobel on osteomyelitis and septic arthritis. These very serious and relatively common conditions can be difficult to diagnose and if the diagnosis is missed, they may present very serious consequences. As in the other articles in this issue, all of the basic modalities of radionuclide imaging are discussed with their relative merits reviewed, but at the present time planar and single-photon emission computed tomography imaging continue to be the most successful techniques.

An alternative point of view is presented by Dr. Basu and coworkers working in Dr. Alavi's laboratory. Dr. Alavi's group has become convinced that PET will emerge as the primary diagnostic tool in infection. They make a strong case for this argument and support their thesis by reviewing many of the diseases that are later discussed in detail by the contributors to this issue of *Seminars*. Some of their views have not achieved unanimity, but they certainly make a very strong case for a wide variety of infectious illnesses that there is currently a role for PET and there is a likelihood this role will increase.

Drs. Palestro and Love's review of nuclear medicine in diabetic foot infections takes us into surely one of the most challenging areas of nuclear medicine diagnosis. The differentiation between superficial ulceration and actual osteomyelitis is particularly important in the diabetic foot, where the rate of amputation in the world is alarming. Although they accept a potential role for PET, it is their viewpoint at this point in time that this role has not yet been adequately clarified and the standard procedures remain the procedures of choice.

Finally, Drs. Love, Marwin, and Palestro discuss prosthetic joint infection. This too, represents a critically important, but difficult, area of diagnosis. They point out that there are enough agents available and being developed to help clarify clinical problems in this setting. The authors' position with respect to PET is that it needs further confirmation as to its use in the diabetic foot.

Clearly, the role of nuclear medicine in infection is a significant and growing one. The next issue of *Seminars* will continue this discussion with more of the important indications for nuclear imaging as we move on to other, perhaps less common but equally significant, applications.

Leonard M. Freeman, MD
M. Donald Blafox, MD, PhD