and cellular inadequacies in dealing with that stress might be important in producing the membrane damage that leads to the formation of irreversibly sickled cells. Evidence now indicates that the erythrocytes in most sickle-cell patients have subnormal resistance to oxidant stress because of low cellular concentrations of glutathione. In addition, erythrocytes of sickle cell patients are deficient in vitamin E and their leukocytes have decreased ascorbic acid reserve.

Uric acid (UA) has long been considered as simply a waste product of human metabolism. However, and perhaps significantly, Ames et al. (Proc Natl Acad Sci USA 1981;78:6858-62) have suggested that in various physiological situations, some of the reductive activity of ascorbic acid may be replaced by the same activity of UA, which is comparable to ascorbic acid in trapping certain free radicals in vitro; thus, in body fluids, UA may act as a free-radical scavenger. Furthermore, concentrations of UA in blood have been shown to be increased after a severe oxidative stress. Therefore, one can speculate that, compared with normal individuals, sickle-cell patients may be able to provoke an increase in UA in body fluids to offset a substantial loss of cellular antioxidants.

To investigate this possible role of UA, I concurrently determined concentrations of UA (by the uricase method) and the ratios of UA to protein and UA to albumin in serum from 12 sickle-cell patients (six men and six women, ages 19 to 39 years) and compared the results with 83 age-matched normal controls. Among the sickle-cell patients, seven were in crisis situation.

<table>
<thead>
<tr>
<th>UA, mg/L</th>
<th>UA/albumin</th>
<th>UA/protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Mean 48.8</td>
<td>SD 12.0</td>
</tr>
<tr>
<td>Sickle-cell group</td>
<td>Mean 68.5</td>
<td>SD 20.1</td>
</tr>
</tbody>
</table>

I also noted that the crisis situation does not affect UA concentrations in serum. These data suggest that the hyperuricemia observed in the sickle-cell patient may be an obligatory response to the disease, to combat a constant endogenous oxidation insult resulting from the chronic deficiency of cellular antioxidants.


For the Becton Dickinson prolactin radioimmunoassay kit, two different methods are given on how to use the reagents. The kit insert indicates that 100 μL of patient's serum, 100 μL of tracer, and 100 μL of antiserum be mixed and incubated for 1.5 h at 37 °C. We refer to this as the "short assay." A technical bulletin from the firm notified us that we could use an "overnight procedure" by decreasing the volume of antiserum to 50 μL, then incubating for 18 to 24 h at room temperature. Longer incubation, which usually results in equilibrium and hence often yields superior precision, posed no inconvenience, so we evaluated both the short and "overnight incubation" assays.

Our initial experiment showed that the "overnight procedure" is indeed more precise at low prolactin concentrations: it has precision similar to that for the short assay at the medical decision value of 20 μg/L but worse precision at higher values, so that on balance we conclude that overnight assay has no advantage over the short assay with respect to precision.

Surprisingly, the "overnight procedure" gave results that were almost 40% higher for a serum that had a prolactin concentration of 47 μg/L. In a patient-comparison study we found that the "overnight procedure" consistently produced higher results than did the short assay at prolactin values >40 μg/L. Three patients' sera read >100 μg/L on the "overnight procedure" but 64, 75, and 82 μg/L in the short assay. For this reason we tested for parallelism with a patient's serum in both the overnight and short procedures, by assaying various dilutions of the specimen with zero standard. The "overnight procedure" showed marked non-parallelism whereas the short assay exhibited parallelism. Because of this non-parallelism, the overnight procedure overestimates prolactin values that are >40 μg/L and thus produces erroneous results for diluted sera. For this reason the overnight procedure is not suitable for clinical use. The short assay does not have these problems, and it thus is a good assay system.

### Modified ELISA for the Measurement of Urinary Albumin, W. E. Whitfield and F. W. Spierio (Division of Environmental Health Laboratory Sciences, Center for Environmental Health, Centers for Disease Control, Atlanta, GA 30333)

Clinical interest in the use of urinary albumin measurements for assessing renal damage has increased. The method used must be reliable, accurate for a wide range of albumin concentrations, and capable of a high analytical volume. One reliable method for measuring urinary albumin is an enzyme-linked immunoassorbent assay (ELISA) reported by Fielding et al. (Clin Chem 1983;29:355-7). In an effort to produce an easier and more efficient method for measuring urinary albumin, we pursued modification of their procedure. Whereas the method of Fielding et al. is a three-antibody system, we use only two antibodies. Fielding et al., after incubating the urine specimen, added rabbit anti-human albumin antiserum, followed by horseradish peroxidase-labeled goat anti-rabbit IgG sera and substrate. In the modification, after incubating the urine specimen, we added 200 μL of horseradish peroxidase-labeled goat anti-human albumin antiser diluted 15 000-fold in phosphate-buffered saline (10 mmol/L, pH 7.4) and incubated for 2 h at ambient temperature. The plates were then washed and developed with substrate according to the method of Fielding et al. We compared results by the two methods by assaying urine specimens from 84 human volunteers. A correlation plot (range 0.5 to 32 mg/L) of the data produced a slope of 0.9942, an intercept of −0.7134 mg/L, and a correlation coefficient of 0.9728. Analyses of quality-control specimens of 1.5 and 6.25 mg/L showed that the CVs with both methods were about 7%. From the data, we conclude that there is no statistical difference between the results obtained by the two methods. Our modified method is easier and faster, and allows more samples to be processed without compromising precision and accuracy.