universal phenylketonuria/hypothyroidism screen. The project was based on an hypothesis first outlined by Crossley et al. (*1*), viz., that an abnormally high blood IRT value for a newborn is suggestive of cystic fibrosis (CF). Details of the methods were previously described (*2*).

We tested 25 000 newborns and identified seven infants confirmed to have CF. One of the seven was not detected in the initial assay, but a repeat card, taken one week later because the infant was premature (birth weight, 1086 g), revealed an increased value for IRT. Values for all affected infants were within the top 1% of each assay run of 200 specimens.

During the project period, eight infants were diagnosed with CF. The one not detected by the IRT program did not have a filter paper card taken at birth.

From our experience, we conclude that the IRT test is a reliable indicator of infants with CF if the reagents used are of good quality and the specimens are fresh. We would use only reagents comparable to those outlined by Crossley et al. (*3*) and would assay the specimens within a few days of their arrival at the screening laboratory.

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Abnormally High Concentrations of β_2-Microglobulin in Acquired Immunodeficiency Syndrome (AIDS) Patients

To the Editor:

β_2-Microglobulin, a small peptide (M_r 11 600), is normally present in trace amounts in both serum and urine (*1*). It may play an important role in the immune function of the body because of its association with histocompatibility antigens (*2*) and also because its amino acid sequence closely resembles that of the constant part of the immunoglobulin chain (*3*).

This peptide not only is present on the surface membrane of both B and T cells (*4*) but also in the membranes of all nucleated cells (*5*). Data on its concentration have been used as a reliable indicator of glomerular and tubular functions (*6*). Abnormally high concentrations of it have been reported in patients with impaired renal functions (*6*), rheumatoid arthritis and Sjögren's syndrome (*7*), and malignant tumors (*8*), and more striking increases were shown in lymphoproliferative disorders (*9*). More recently, increased concentrations of β_2-microglobulin were shown in an immunodeficient homosexual man (*10*).

In the present preliminary study, we have determined β_2-microglobulin in the sera of patients with AIDS, as tabulated below. Note that 29 of 31 patients with AIDS had supranormal β_2-microglobulin concentrations, whereas five of 11 normal homosexual men had increased values as compared with normal controls.

	β_2-Microglobulin, mg/L		
No.	Range	Mean	SD
	Normal controls		
15	1.6–2.4	1.9	0.24
	AIDS patients		
31	2.0–16.0	6.2	3.50[a]
	Normal homosexual men		
11	1.7–4.5	3.0	1.00[b]

[a] Different from normal homosexual men at $p < 0.01$.
[b] Different from normal controls at $p < 0.001$.

Serum β_2-microglobulin is thought to originate mainly from the surface of cells, and it increases with increased cellular turnover (*10*). Hence, the increased values in AIDS patients are indicative of an increased turnover of cells in such patients.

Thus far it has been demonstrated that reversal of ratios of helper to suppressor T-lymphocytes and lymphopenia are markers of AIDS (*11, 12*). We believe that increased β_2-microglobulin may provide yet another diagnostic marker for AIDS patients.

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Choice of a Satisfactory Evacuated Blood-Collection Tube for Magnesium and Zinc Assays

To the Editor:

Requests for magnesium and zinc assays in plasma and erythrocytes relative to research studies entail extra work for hospital nursing personnel as well as an additional blood sample from the patient. Moreover, the recent widespread and generally mandatory practice of using evacuated blood-collection tubes in our regional hospital has obliged us to abandon the use of polystyrene tubes and of polyethylene natural stoppers, which had proved quite acceptable (*1*), and to search for an evacuated blood-collection tube yielding the least possible Mg and Zn. In effect (though too often apparently ignored) conditions of taking and preserving blood samples on results for

Table 1. Statistical Summary of Results for Mg^{2+} and Zn^{2+} in Vacutainer Tubes[a] after 28 h of Contact with Strontium Chloride Solution

	Tube 1	Tube 2	Tube 3	Tube 4	Tube 5
Magnesium (n = 9)					
Mean, nmol/L	1471	1749	1761	1955	1601
SD, nmol/L	28.4	30.0	27.6	55.6	38.7
CV, %	1.63	1.70	1.56	2.84	2.40
	Tube 6	**Tube 7**	**Tube 8**	**Tube 9**	**Tube 10**
Zinc (n = 9)					
Mean, nmol/L	434	376	959	537	512
SD, nmol/L	13.3	13.5	25.8	22.6	19.4
CV, %	3.06	3.58	2.70	4.22	3.79

[a] Becton-Dickinson (No. 6527).

plasma or erythrocyte Mg (*1*) or Zn (*2*) are evidently crucial. Several types of such tubes customarily used in different departments of our hospital were tested in the presence of 154 mmol/L sodium chloride solution, a solution appropriate to Mg assay (9.38 mmol/L strontium chloride solution) (*1, 3*), or plasma, and many proved unsatisfactory. A quite significant increase in values for Mg and Zn concentrations was noted as a function of the period of contact, the number of stirrings, and the number of stopperings and unstopperings, so that these results led us to test Vacutainer Tube no. 6527 containing sodium heparin (Becton-Dickinson France, B.P. 798, 38100 Grenoble, France), which is especially suitable for collection of specimens for trace-element determinations.

Ten Vacutainer Tubes, filled to stopper level with 9.38 mmol/L strontium chloride solution, were given 10 1-min stirrings during a 28-h period. Five tubes were used for Mg assays and five for Zn assays by flame atomic absorption spectrometry (Hitachi Model 180–80 with Zeeman effect). Nine successive Mg or Zn determinations were performed for each tube, and the results are summarized in Table 1.

Evidently, Becton-Dickinson Vacutainer Tubes (no. 6527) are entirely satisfactory for plasma Mg assays, for which we have previously reported a mean concentration of 0.89 mmol/L for normal men and women (*3*), but less satisfactory for assaying plasma Zn, which is found in much lower concentrations (*2*). Moreover, these tubes are intended for a 10-mL blood sample, a not-inconsiderable volume for certain patients.

Thus we were then prompted to compare these results with those obtained with Venoject Tubes of 5-mL capacity (Reference T 206 LH, Code VT 050 HL1) and containing lithium heparin (Terumo France, 2 rue Stephenson, 78181 Saint-Quentin-en-Yvelines Cedex, France). The results for Mg were less satisfactory, because after only 6 h of contact with 9.38 mmol/L strontium chloride solution the mean Mg concentration in five tubes was already 3.02 (SD 0.65) μmol/L. In one tube, after eight days of contact, the Mg concentration was 32.9 μmol/L. However, if contact is limited to a few hours, these tubes are entirely satisfactory for routine use in assaying Mg. With respect to Zn concentrations in the same five tubes, the mean value after 6 h of contact was only 71.4 (SD 16.5) nmol/L, quite acceptable for plasma Zn determinations.

We conclude that it is essential to check the Mg and Zn concentrations yielded by tubes that are intended for use with blood samples before undertaking any experiments in human pathology involving these two cations.

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Cerebrospinal Fluid Immunoglobulin D in Myasthenia Gravis

To the Editor:

The normal values for concentrations of immunoglobulins in cerebrospinal fluid (CSF) were established by Nerenberg and Prasad (*1*), using the radioimmunoassay technique. Since 1975 this laboratory has been actively studying the clinical significance of IgD in CSF. Even though much work has been done on the structure and function of IgD (*2*), very little is known concerning the diagnostic usefulness, if any, of this protein. While studying CSF immunoglobulin concentrations in aseptic meningitis, multiple sclerosis, malignant brain tumor, and hydrocephalus groups during these years, the values for IgD in all these diseases were seen to either remain normal or closer to the lower end of the normal range (*3*). However, such results for cases of myasthenia gravis (MG) were different. The results in the following tabulation indicate that IgD concentration is markedly above normal in the four patients in whom it was measured.

Patient no.	IgG, mg/L	IgA μg/L	IgM μg/L	IgD Int. units/L	IgE Int. units/L
Normal	1–62	140–2340	0–650	0–6600	0–72 000
1	16.0	1200	210	37 800	5800
2	15.0	670	115	27 900	5000
3	14.0	330	115	11 900	zero
4	16.0	858	100	19 900	4000

Myasthenia gravis may be the result of a decrease in the available acetylcholine receptors in neuromuscular junctions, consequent to some form of autoimmune injury (*4*). Acetylcholine antibodies were detected in the serum of 14 of 15 myasthenic mothers and 16 of 17 of their children, and both IgG and C_3 were localized at the postsynaptic membranes of neuromuscular junction (*5*). The role of acetylcholine receptors in myasthenia gravis is established, but nothing is known about the association of IgD with this disease or any other neurological disorder. As noted earlier, other CSF immunoglobulin concentrations are within the normal range, but the IgD concentration in CSF is markedly increased in MG. This preliminary observation predicts a role of IgD in MG and suggests that more work is needed to determine that role in its pathogenesis.

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