incorporation approximately threefold. Control MAF-treated M usually augmented tumor cell
growth, while Con A MAF-treated M augmented tumor growth in approximately 20% of the
cases, did not significantly affect tumor cells in 30% of the cases, and inhibited tumor cells
in 50%. Lymphoid and lymphoma cells were the most sensitive. In vivo induration was induced
as follows: 0.1 unit, 5 mm; 0.2 unit, 10 mm; 0.5 unit, 20 mm; 1.0 unit, 40 mm. At doses ≥ 0.5
unit, all patients (even those anergic to recall antigens) responded. These data suggest that
these methods should be useful in evaluating M and lymphokine function and their modulation
by therapy in man.

Detection of Lymphotxin in Vivo in the Sera of Human Patients with Several Types of
Suspected Autoimmune Diseases. L. Masters, I. Shimizu, and G. A. Granger, University
of California, Irvine, California.

One family of human lymphotoxins (α) is relatively stable once released by the activated
lymphocyte in vitro. In addition, there are highly sensitive and semiquantitative in vitro tests
for detection of LT activities. We reasoned that it may be possible that activated lymphocytes
in certain in vivo situations may release enough LT to be detected in the systemic circulation or
local microenvironment in situ. Initial experiments revealed human sera rapidly inactivates
both α- and β-LT activities. Fresh serum samples from patients and control volunteers were
collected and treated to reduce LT inactivation, and dilutions were immediately tested for toxic
activity on L-cells. Variable levels (from 20 to 160 units) were detected in sera from all
patients tested (19 rheumatoid arthritis and 7 multiple sclerosis). In contrast, no evidence of
LT was detectable in the serum from control male and female subjects, whose ages ranged from
20 to 68. Cytotoxic effects were identified by specific inactivating antisera as being members of
the α-LT family. We are currently examining sera from patients with allografts and neo-
plasia. These and additional data indicate that this may be an in vivo indicator of ongoing CMI
reactivity.

Production of IDS (Inhibitor of DNA Synthesis) by Proliferating Lymphocyte Populations
in Rat Thymus and Spleen. B. H. Waksman and Y. Namba, Yale University, New
Haven, Connecticut.

IDS, an acid glycoprotein of 75,000–80,000 molecular weight, is produced by ovalbumin-
sensitized rat LNC restimulated with antigen and by normal LNC exposed to Con A. With
optimal Con A stimulation, IDS is formed by spleen cells within a few hours, thymocytes are
formed after 24 hr, and LNC is formed only at 3–4 days. It is not produced in significant
amount by hydrocortisone-resistant thymocytes. Spleen cells from rats given 100 mg of oval-
bumin intravenously 24 hr earlier, when cultured without further stimulation, released large
amounts of IDS. IDS production is abrogated in LNC treated with mitomycin C and spleen
cells exposed to BUdR. Thus, IDS production is closely correlated with nonspecific suppressor
cell activity in thymus and spleen and appears to depend on proliferative activity stimulated
specifically with antigen or nonspecifically with mitogen in these cells. Independent evidence
from migration studies (H. G. Durkin, J. Carboni, and B. H. Waksman, unpublished data)
shows accelerated migration of thymocytes to the spleen after a large intraperitoneal dose of
antigen and suggests the essential identity of the two nonspecific suppressor cell populations.

SESSION VI: Characterization

Effect of Anti-Lymphotxin on Cell-Mediated Cytotoxicity: Evidence for Two Pathways of
School of Medicine, Baltimore, Maryland.

A rabbit anti-lymphotoxin serum produced against partially purified, antigen-induced, guinea
pig lymphotxin (LT) was used to study the role of LT in lymphocyte-mediated cytotoxicity
in vitro. The anti-LT serum inhibited cytolysis, resulting from incubation of ovalbumin-immune
guinea pig spleen cells with either mouse (P815 mastocytoma) or guinea pig (line 10 hepatoma)
target cells in the presence of soluble ovalbumin. The antisera also inhibited cytolysis of oval-
bumin-coupled target cells by ovalbumin-immune guinea pig spleen cells. In contrast, the anti-