

transplantation antigens. The Oak Ridge National Laboratory is also actively engaged in utilizing various separation systems for the production of macroglobulins and also in the development of improved viral diagnostic methods for the National Communicable Disease Center.

One of the centrifuge systems developed by the Oak Ridge National Laboratory's Molecular Anatomy Program is the K-II series rotor which is useful in the purification of vaccines since it can handle large quantities of material (up to 50 liters). Eli Lilly and Company, which is one of several companies participating in the testing and evaluation of these new centrifuge systems, aided in the testing of the K-II series rotor using egg-grown influenza vaccine as a model. By using the K-II series rotor system, ORNL and Lilly scientists were able to remove much of the extraneous protein material from the vaccine which resulted in an improved product that is highly purified and concentrated. Although there was no collaboration on the part of NIAID scientists on this particular vaccine development program, NIAID support to ORNL for centrifuge development studies for the past five years certainly materially aided in this advance.

This arrangement with ORNL has worked out very satisfactorily from the standpoint of NIAID. At the time this work was initiated, ORNL had the best capability for work on the zonal ultracentrifuge and NIAID was able to aid in supporting the development and to accomplish its own objectives sooner than by using any industrial group. At the present time, the Institute obtains, for its own use, experimental centrifuge systems which are not yet commercially available in order to solve special problems. NIAID scientists aid in the evaluation of these various systems and in so doing shorten the time period needed to make these special systems available to the general scientific community.

NCI. The interagency agreement with the AEC to support research under the direction of Dr. Norman Anderson at Oak Ridge has been highly satisfactory from the point of view of the NCI. Initially this activity was concerned principally with the development of advanced zonal ultracentrifuge equipment, and more recently has been expanded to include the applications of this equipment to the isolation and differential characterization of components between normal and cancer cells particularly in mammalian cells affected by oncogenic (cancer-producing) viruses. Progress during the last year has included the production of three new and four modified centrifuge rotors, all designed for specific cellular or virus separation problems, and the development of specialized preparative electrophoresis equipment for separating cancer virus induced antigens from hamster cells. The progress has been substantial because of the unusual combination of engineering and scientific skills available at Oak Ridge.

The relationship with Oak Ridge is both similar to and different from the relationship between NCI and other industrial and educational contractors. It is similar in the sense that each year the work is reviewed through periodic progress reports, and once each year a proposal is submitted for work planned the following year. This proposal is reviewed formally in the context of progress made during the previous year. The review procedures are essentially the same as those applicable to any other NCI contractor. There is also a close working relationship between the NCI Project Officer, Dr. Charles Boone, and the Principal Investigator at Oak Ridge, Dr. Norman Anderson. The agreement is basically a cost-reimbursement agreement.

The arrangement is different in the mechanical funding and billing process and its initiation. Instead of a contract negotiated by NIH contracting officer and a representative of an industrial concern, there is an interagency agreement between the AEC and NCI; AEC then authorizes its contractor, Union Carbide Nuclear Corporation to proceed with the work within its contract with AEC concerned with the operation of the Oak Ridge facility. Detailed invoices and billings are provided to AEC which has audit responsibilities. NCI is billed on a quarterly lump-sum basis through a "1080" transfer of funds between appropriations.

The NCI maintains a close working relationship with Oak Ridge on progress of the work. The NCI Project Officer and the Principal Investigator at Oak Ridge are in frequent contact. Progress reports are reviewed in much the same manner as work of direct contractors.

The business arrangements are quite satisfactory, and NCI benefits from existing mechanisms used by AEC in providing supervision of its total contract. These include on-site management, voucher audit payment, continuous internal audit, etc. The NCI determines the level of funding and work to be performed. If AEC agrees, it amends its task requirements and budget under its overall