III. RESEARCH RESOURCES

INTRODUCTION

The biotechnology industry started in the universities, where basic research on the technology was captured commercially by patenting research and by licensing these patents to industry. In the early days (1976), only the Big Three of university technology transfer - Stanford, University of California, and Massachusetts Institute of Technology - consistently and aggressively sought out university inventions. The explosion of biotechnology companies, 3 in 1976 to 1330 in 1995, has been paralleled by the rise in U.S. patents granted to universities during this same time period; 230 in 1976 to 1800 in 1992 (Terry, 1993) Today, more than 90 percent of the universities are being awarded patents on a annual basis. The rich treasure of potential patents, research collaborators, research facilities, and technically trained personnel available at universities creates the environment for the development and growth of biotechnology companies. Proximity to the founding researchers' academic institution is the key factor in biotechnology company location. The North Central region of the United States is home to world-renown universities, hospitals and federal laboratories, from which are produced leading-edge biotechnology research in medicine and agriculture.

The following section reviews the biotechnology research activities in this region. For further information about a research centers and technology transfer opportunities, refer to Appendices A - D.

MEDICAL RESEARCH. The explosion in medical biotechnology research has revealed that virtually every disease has a genetic basis. That discovery, added to new information provided by the mapping of the human genome, is leading medical science to the threshold of a new era, the era of genetic medicine. Nearly all medical research on diseases utilizes the tools of biotechnology. Scientists and clinicians at the medical schools, research institutes and clinical hospitals in the North Central U.S. (see Table 1) are making major contributions to the field of genetic medicine.

Colorado. The *University of Colorado, Health Sciences Center*, located in Denver, has five separate schools devoted to Medicine, Nursing, Dentistry, Pharmacy and graduate education. Together they serve more than 2,000 students in their basic science and clinical programs in two teaching hospitals, an National Cancer Institute-designated Cancer Center, numerous teaching and research facilities, and affiliated institutions The affiliates include: the Barbara Davis Center for Childhood Diabetes; the Eleanor Roosevelt Institute for Cancer Research; the National Jewish Center for Immunology and Respiratory Medicine, the University Hospital, and the Childrens Hospital. Research conducted at the CU Health Sciences Center campus has given rise to many innovations in areas such as biological growth factors, chromosome analysis, cell cloning, drug delivery systems, and vaccines for infectious diseases. The CU Health Sciences faculty have a long history of federally funded and privately sponsored clinical research.

The Molecular, Cellular and Developmental Biology Department at the *University of Colorado, Boulder* is a top-ranking molecular biology research and training site in the world. With 200 faculty and staff, and Nobel Prize Laureate, Tom Cech, (awarded for Chemistry, 1989 - ribozyme research), the Department produces innovative, breakthrough technology. UC Boulder also is home to the Colorado RNA Center