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BOOK REVIEW

SCHIMKE, R. T. (ed.): *GENE AMPLIFICATION*. — Cold Spring Harbor Laboratory, 1982. 339 pp. Cloth US \$ 35.—, outside US \$ 42.—.

Investigators studying mechanisms of resistance to various agents that kill cells have found that one common mechanism of resistance involves selective amplification of specific genes. The second type of observation that has increased interest in gene amplification involves reports on abnormal chromosomal structures which may be involved in the initiation and/or progression of the malignant state. The "Gene Amplification" summarizes in the form of extended abstracts the results of a conference, held at the Banbury Center of the Cold Spring Harbor Laboratory in 1981. The introductory chapter (R. T. Schimke) provides a brief review of historical highlights on gene amplification for those readers who may be totally unfamiliar with this field. Subsequent papers present examples of gene amplification. The most discussed topic was resistance to methotrexate, associated with amplification of the dihydrofolate reductase gene, studied in murine, CHO and CHL cells, in a human leukemia line and in rat hepatoma cells. The drug-mutants that contain amplified genes are characterized by the presence of either expanded chromosome segments called homogeneously staining regions (HSRs) or extrachromosomal bodies known as double minutes (DMs). The appearance of DMs or HSRs segments in vincristine, antifolate and other resistant lines suggests that gene amplification is responsible for the acquisition of drug resistance. Possible models to explain the mechanism of gene amplification were considered in several papers. Amplification might occur by the excision and extrachromosomal replication of specific segments containing the gene cluster or it could result from the tandem reduplication of such a region within the chromosome. Other papers are focused on the role of gene amplification in differentiation, which is thought to be frequently related to a development need for accumulation of a gene product in a relatively short period of time. Of general importance are the papers: "New approaches to DNA damage and repair (Haseltine *et al.*)" and "Biological role for chromatid exchange" (German). The book provides an interesting overview of current works in the field of gene amplification and of the relation of this phenomenon to malignancy and to the development of resistance to various genotoxic agents.

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