Technologies for Detecting Heritable Mutations in Human Beings

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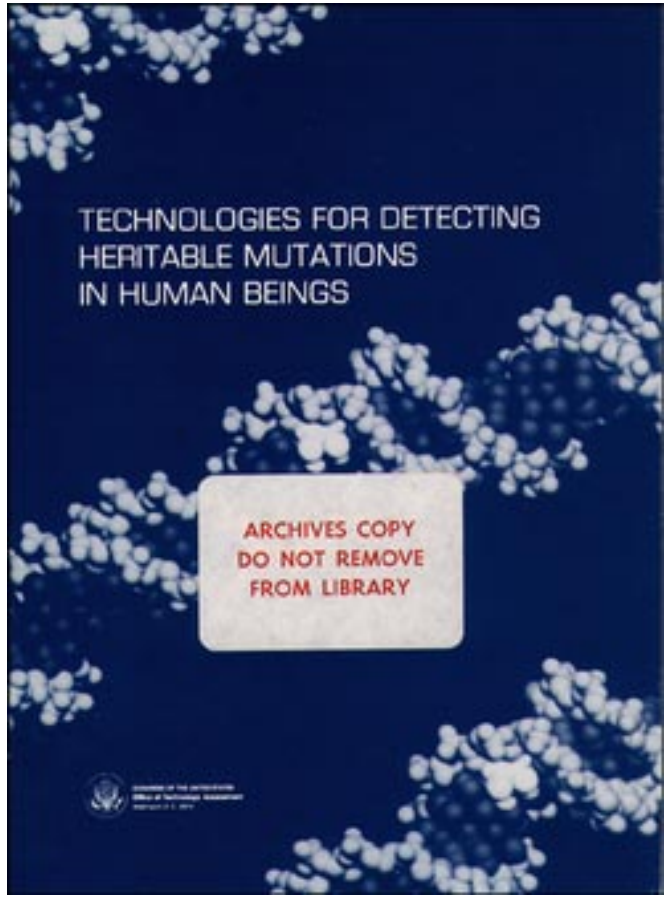

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Foreword

Ensuring the health of future generations of children is of obvious importance to American society. Heritable mutations, permanent changes in the genetic material that can be passed on to succeeding generations, are the cause of a large but currently unquantifiable share of embryonic and fetal loss, disease, disability, and early death in the United States today. The methods now available to study heritable mutations, however, offer relatively little information about the kinds of mutations that can occur, their frequency, or their causes. Recent advances in molecular genetics have opened the door to new and innovative technologies that may offer a great deal more information about DNA. It may soon be possible to characterize mutations precisely, to measure their frequency, and perhaps also to associate particular mutations with exposures to specific mutagenic influences. While some of the new technologies are still *on* the drawing board, they are developing quickly and several of them may become available for wide-scale use in the next 5 to 10 years.

The Senate Committee on Veterans' Affairs, the House Committee on Science and Technology, and the House Committee on Energy and Commerce requested that OTA assess the available information about current and proposed means for detecting heritable mutations and on the likelihood and potential impact of such technological advances. These committees have wrestled with the problems of determining whether past exposures to potential mutagens have affected the health of Americans, and of framing reasonable public health laws, given current knowledge and technologies. This report summarizes OTA's findings as they relate to these issues.

An advisory panel, chaired by Arno G. Motulsky, provided guidance and assistance during the assessment. The OTA Health Program Advisory Committee, OTA staff, and scientific and policy experts from the private sector, academia, and the Federal Government provided information during the assessment and reviewed drafts of the report. We thank all who assisted us. As with all OTA reports, the content of the assessment is the sole responsibility of OTA and does not necessarily constitute the consensus or endorsement of the advisory panel or the Technology Assessment Board. Key OTA staff involved in the assessment were Michael Gough, Julie Ostrowsky, and Hellen Gelband,

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NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

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[1]On detail from the National Institutes of Health, April-June 1985.