



## INTRODUCTION

# A Race Still Unfinished

FEW SCIENTIFIC ENDEAVORS CAPTURED AS MUCH PUBLIC INTEREST AS THE RACE TO identify *BRCA1*, a gene responsible for inherited predisposition to breast and ovarian cancers. The search culminated in a 1994 *Science* paper reporting the isolation of *BRCA1* by positional cloning.\* Isolation of the related cancer predisposition gene *BRCA2* followed soon after.† Twenty years later, the *BRCA* genes continue to make headlines, sparking a Supreme Court decision on the legality of gene patenting and intense debates on the ethics of genetic testing.

In this special section of *Science*, expert contributors retrace the long and tortuous path leading to the mapping and identification of the *BRCA1* gene; discuss the ways in which *BRCA* mutation status has been integrated into the clinical management of patients in high-risk families; and highlight the role of the *BRCA* proteins in preserving the structural and numerical integrity of chromosomes throughout the cell cycle, a function that may explain their tumor suppressor activity.

*Science's* News team explores many of the issues that have arisen since the discovery of the *BRCA* genes. Advances in molecular medicine have brought new options for treatment and prevention, driving down mortality rates in wealthy countries. But in poor countries, shut out from these advances, mortality rates remain disproportionately high. Widespread breast screening has led to early detection and a new dilemma: whether to aggressively treat noncancerous lesions that may never become invasive or whether to “watch and wait.” Since 1994, dozens more genes have been found that increase a woman’s risk of hereditary breast cancer, but by how much is uncertain, confounding already complicated issues in genetic testing and counseling. Throughout this explosion of research, advocacy groups have been a powerful force in boosting funding and shaping the agenda, and they continue pushing for increasingly ambitious, some say unrealistic, goals.

Clearly much more needs to be done—both more research and better ways to get existing treatments to women who need them. The discovery of the *BRCA* genes was transformative. More than a million women and men have been tested for *BRCA1* and *BRCA2* mutations in the past 20 years, and there is no doubt that the test has saved lives. But mutations in these two genes account for only 5 to 10% of breast cancer cases in the general population, and worldwide, breast cancer remains the most common and most deadly cancer in women. Is it time to start a new race?

— PAULA KIBERSTIS AND LESLIE ROBERTS

\*Y. Miki et al., *Science* 266, 66 (1994). †R. Wooster et al., *Nature* 378, 789 (1995).

## Breast Cancer

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