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The primary objective of this research is to understand historical patterns in the nation's breast cancer research portfolio. To achieve this objective, we created "topographical information maps" of abstracts of breast cancer research articles. The maps look like landscape maps with contour lines indicating elevation. Peaks represent scientific areas where there is a great deal of research. Valleys represent areas where there is comparatively little research. Islands represent opportunities for interdisciplinary or translational research. Hills appearing in close spatial proximity indicate closely related areas of research. Hills appearing far apart indicate research areas where there is currently little synergy.

Interactive versions of these maps are available at <http://www.hprg.uci.edu>. We hope our work will help scientists, policy makers, research administrators, and advocates understand historical research patterns aiding their efforts to set future scientific priorities toward the goal of eradicating breast cancer.

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INTRODUCTION:

The primary objective of this research is to create “topographical information maps” to explore patterns in breast cancer research. Scientists, activists, opinion leaders and funding agencies all want to understand our current portfolio of breast cancer research in order to plan future research directions and prioritize investment in understudied areas. This planning could be aided by an easily comprehensible map of current and historical research. A map would allow for the identification of areas where there has already been a lot of research and areas where new research might be fruitful.

BODY:

We used a novel informatics tool called “Themescape” to create maps of all breast cancer research published in journals since the year 1966. We divided historical research into four time periods according to the date of publication and created four corresponding maps. These maps are numbered 15-18 on our web site <http://www.hprg.uci.edu>.

- Map 15. Journal articles, 1966-1984
- Map 16. Journal articles, 1985-1989
- Map 17. Journal articles, 1990-1994
- Map 18. Journal articles, 1995-present

To identify articles, we searched MEDLINE on MESH subject terms such as “breast neoplasm”. The maps are based on abstracts from journal articles. The oldest one, map 15, is based on 11,221 abstracts; map 16 is based on 10,583 abstracts; map 17 is based on 15,258 abstracts; and the latest one, map 18, is based on 26,548 abstracts.

After creating the maps, we found that because they depict research ranging from the most basic to the most applied, interpreting the patterns required a broad understanding of the science of breast cancer. Consequently, we decided to seek the advice of breast cancer experts in interpreting the maps. We developed a survey inquiring about the patterns they observed, the meaning of those patterns, etc., and pilot tested the survey. We then applied for and received a grant from the University of California Irvine Newkirk Center for Science and Society to survey national breast cancer experts, asking them to interpret the maps. We obtained human subjects approval and we are now in the process of administering this survey. Once we have completed our survey of breast cancer experts we will have a better understanding of the meaning of the patterns that are visible in the maps. We will then draft manuscripts based on the patterns identified.

Interactive maps are currently available on our web site <http://www.hprg.uci.edu> and also appear in the appendix to this final report.

KEY RESEARCH ACCOMPLISHMENTS:

- Created Themescape maps of 63,610 breast cancer research articles published over more than three decades. See <http://www.hprg.uci.edu>
- Applied for and received additional grant funding to survey breast cancer experts inviting them to interpret the maps.

REPORTABLE OUTCOMES:

Blake C, Tengs T. The nation's breast cancer research portfolio: A view from 30,000 feet. Invited presentation at the Avon Symposium, University of California, Irvine CA, October 2001.

Themescape maps of all published breast cancer research. See <http://www.hprg.uci.edu>

Principal investigator, "Improving Scientific Policymakers' Understanding of the Nation's Breast Cancer Research Portfolio," University of California Irvine Newkirk Center seed grant, awarded 2002.

CONCLUSIONS:

We created maps of all breast cancer research published over the last several decades. The maps show peaks where there is a great deal of research and valleys where there is little research. We hope that these maps will be of use to scientists, policy makers and opinion leaders as they set future scientific priorities in breast cancer.

REFERENCES:

Blake C, Tengs T. The nation's breast cancer research portfolio: A view from 30,000 feet. Invited presentation at the Avon Symposium, University of California, Irvine CA, October 2001.

Themescape maps of all published breast cancer research. See <http://www.hprg.uci.edu>

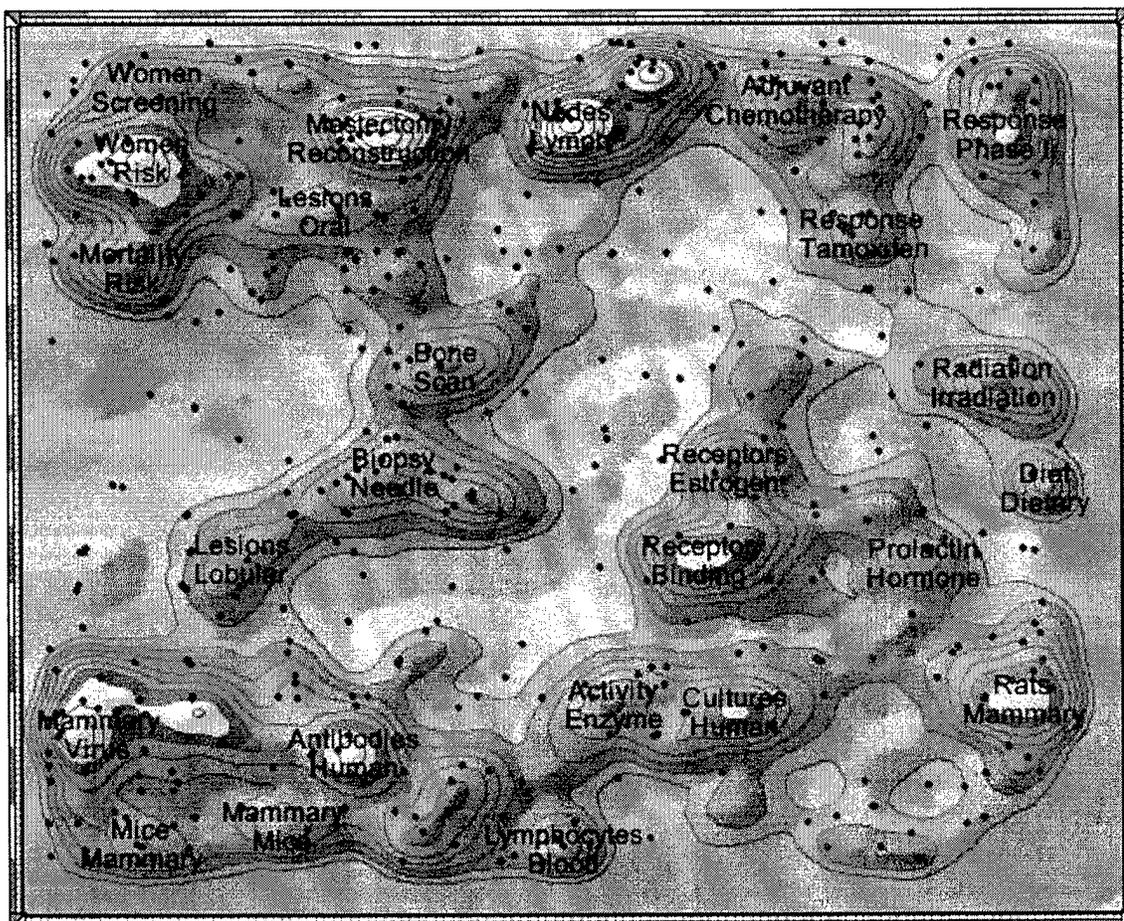
Principal investigator, "Improving Scientific Policymakers' Understanding of the Nation's Breast Cancer Research Portfolio," University of California Irvine Newkirk Center seed grant, awarded 2002.

APENDICES:

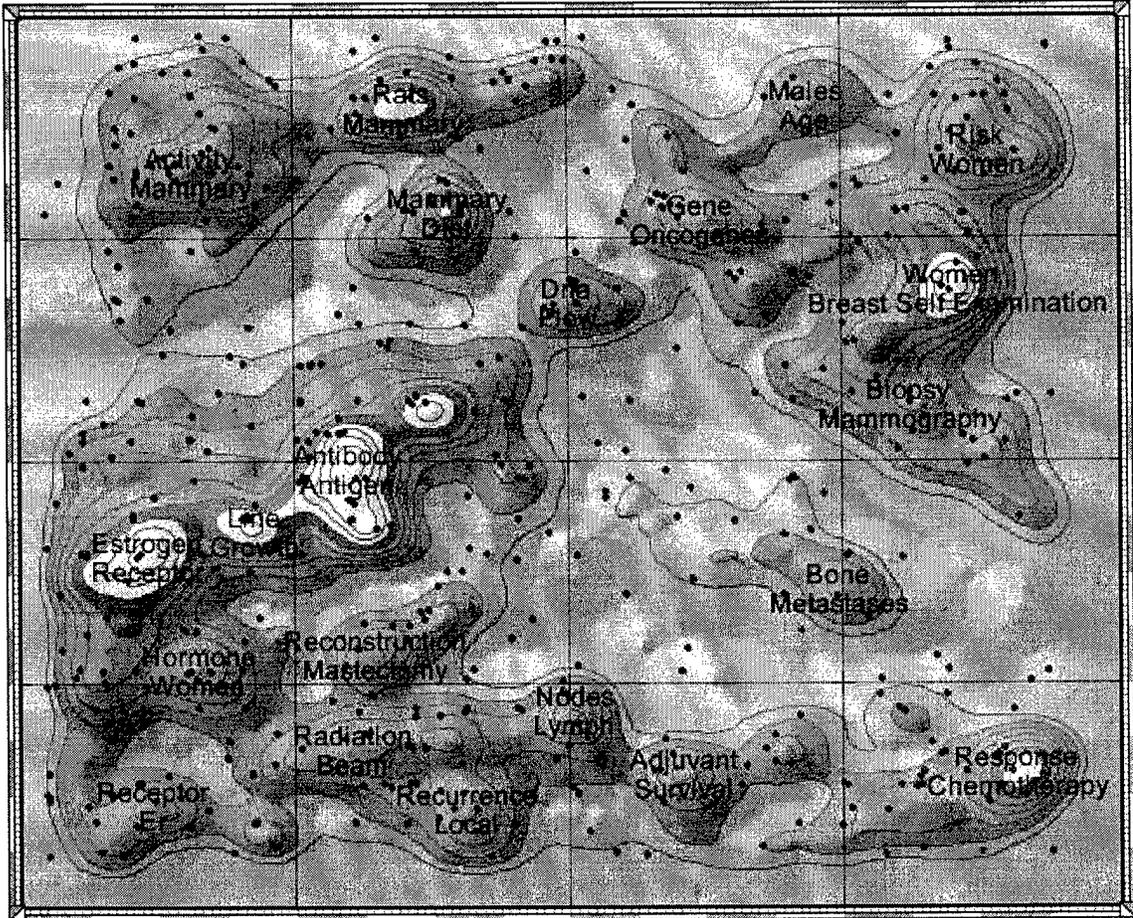
Four maps are attached.

Appendix

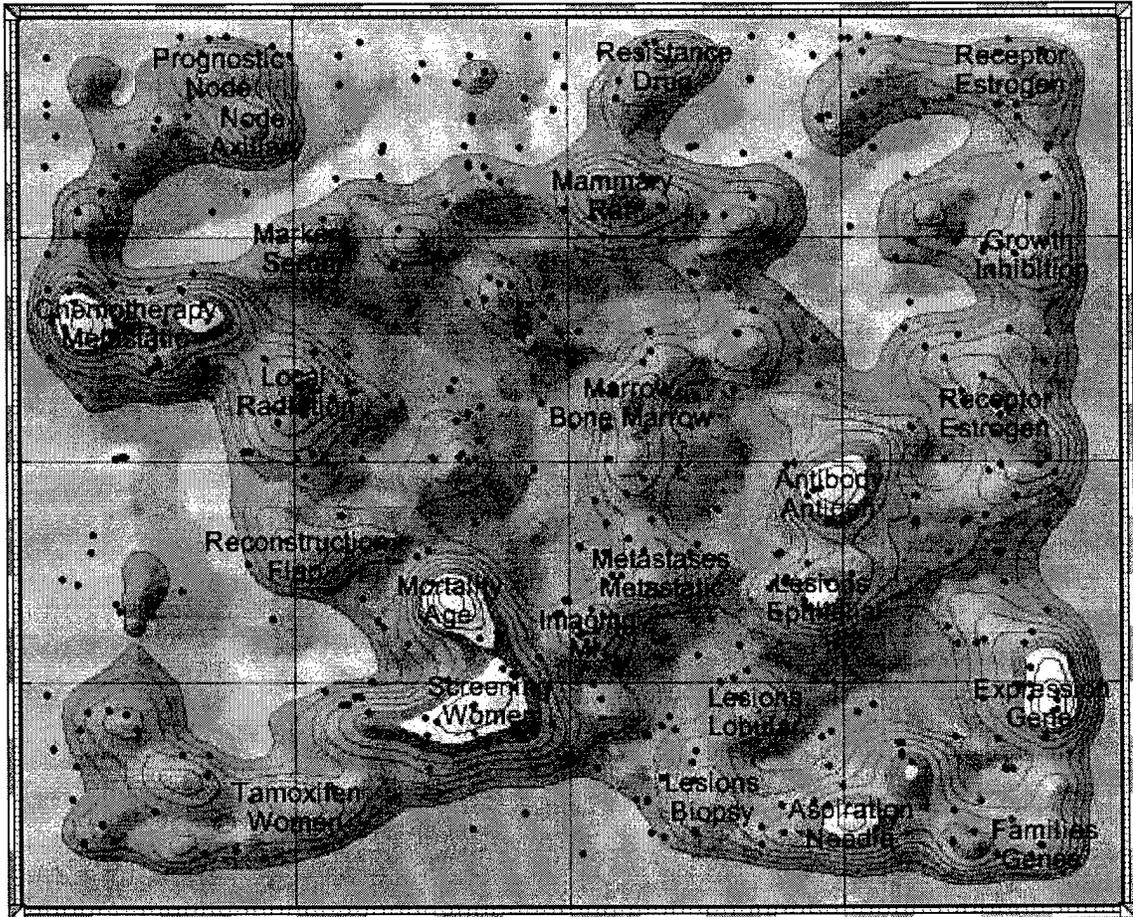
Themescape Maps of Abstracts from
Published Journal Articles on Breast Cancer Research



Map 15. Journal articles, 1966-1984



Map 16. Journal articles, 1985-1989



Map 17. Journal articles, 1990-1994

