

II. Introduction

CHI Research, Inc. was engaged by the National Science Foundation through a subcontract to Abt Associates to undertake a bibliometric analysis of the emerging area of tissue engineering with the intent of describing quantitatively NSF's role in the area and examining the co-authorship structure of the field.

The project consisted of five parts:

1. Identifying core papers fundamental to tissue engineering
2. Constructing a database of information on the papers
3. Analyzing the nature and extent of NSF's overall role in the field as revealed through funding acknowledgements on papers
4. Developing representations of coauthorship information for leading authors in the field, with indications of NSF's presence.
5. An analysis of international patenting in tissue engineering

This report describes each of these steps in turn. The first section describes how the foundation for the analysis was carefully laid through development of a sophisticated methodology developed specifically to identify core papers fundamental to tissue engineering. After this, a basic description is offered of the growth of tissue engineering, as revealed in the full paper set and in a special set of papers that use the term "tissue engineering" in their abstract or title. There follows a quantitative analysis of NSF's role as revealed through acknowledgments of funding reported on papers. Then maps and tables are presented that together reveal the patterns of coauthorship in the field and NSF's presence within the oeuvre of leading authors. Finally an analysis of international patenting in tissue engineering is reported.

III. Methodology

A. Finding core papers fundamental to tissue engineering

The fundamental methodological work in this project was to devise a way of identifying core papers fundamental to tissue engineering. This was very challenging. CHI needed to identify the papers in a rapidly evolving area that brings together a heterogeneous set of technologies and research approaches, and in which no two researchers seem to agree on a definition. At some level, all biomedical knowledge not directly concerning disease probably will contribute to tissue engineering. However, time was limited, so every biomedical paper could not be assessed for relevance to tissue engineering.