# Et Cetera

## New Techniques for Structuring, Searching, and Synthesizing Scientific Information: The Mega-Benefits of Micro-Knowledge

*Chair:*
**Tom Lang**
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*Panelists:*
**Gretchen Purcell**
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**Joseph Lau**
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Gretchen Purcell began with a discussion of context-based markup language, developed as part of her doctoral dissertation in medical informatics and now in use at the Annals of Internal Medicine. This markup language allows for more precise online searches in that it takes advantage of the natural structure of a clinical research paper—title, author, objective, background, and so on—and a sentence's placement within that structure (in contrast with literature-searching tools that are based primarily on individual words). Anchoring words in such a "semantic context" means, for example, that a searcher can specify that "stroke" be used as an outcome rather than as part of a study's patient population. In addition to returning more-accurate search results, Purcell reports that it helps authors to write better, more-structured papers. The coding is done manually; after minimal training, a person can code an article in about 15 to 20 minutes.

**Using RTMAS, one can look at many controlled trials at once**

Joseph Lau described the Real-Time Meta-Analysis System (RTMAS), which allows one to store, organize, and synthesize relevant clinical research with a computer program. The process begins with the selection of papers for "data extraction"; relevant information is summarized in various categories (data-abstraction questionnaires exist for this purpose) and entered into a database. Using RTMAS, one can look at many controlled trials at once and compare categories of interest, such as drug class and patient profiles. The computer-generated comparison matrices, termed "evidence tables", are of great benefit in conducting a systematic review of a group of studies. RTMAS, now available only as a prototype, can help track the development of clinical evidence and facilitates the synthesis of clinical information.

Peter Goldie talked about a recent European conference on eXtensible Markup Language (XML) in which advances in the use of XML in health care were reported. XML was successfully applied to, for example, patient and billing records, and it allowed for better human-to-computer and computer-to-computer communication. Goldie underscored the immediate need to apply a structure to future data so that data extraction will be easier; it is difficult to extract data from established legacy systems. He suggested that structure always be correlated to style—for example, correlating a structure to a quote allows one to link to the source of the quote—and that the next edition of the CBE style manual include coding schemes.