



## BIOINFORMATICS

As technical capabilities progress, science and technology from a variety of fields tend to intersect more frequently than they did in the past. Such is the case with biology and computer science in the field of bioinformatics. Bioinformatics includes the retrieval, organization, and analysis of biological data and can employ many technologies. Examples of developments where bioinformatics can play a pivotal role are:

- Biopolymer sequence analysis; for example, the sequencing of DNA fragments, proper alignment of sequences, and genome assembly relating to genetic pathologies and cancer-related mutations
- Gene and protein expression analyses, such as serial analysis of gene expression (SAGE), tag sequencing, massively parallel signature sequencing (MPSS), mass data matching against predicted masses from protein sequence databases, promoter analysis, motif sequencing in the DNA surrounding the coding region of a gene, and algorithm clustering that determine which genes are co-expressed
- Structural biology and crystallography
- Biochip patenting and analysis
- Cellular function analysis, such as modeling of biological pathways, microscopy imaging, and data analysis
- Computer-aided disease diagnosis and drug design
- Image databases and methods for search and identification
- Instrumentation patenting and analysis
- Microarray analysis
- Software systems and processes, such as data mining, discovery tools for promoter elements, modeling of exons or regulation motifs, and prediction algorithms

Bioinformatics weaves together numerous disciplines, including computer science, statistics, mathematics, and engineering. Many attorneys at Hamilton Brook Smith Reynolds have advanced degrees and industry experience in these areas, enabling us to assemble a specific team based on the technology to be patented.

In particular, our experience includes various computer analyses of genomes and gene sequences (exons and motifs). Many analyses involve a database storing gene sequence information. Some analyses are disease specific or relate to determining cell function and regulation. As an example, we have prepared and filed patent applications directed to a computer search tool that supports a database for use in analyzing genomes.

We also have drafted patent applications for combined neural networks and decision trees to perform robust allele calling and provide an automated genotyping method and system.

