Private company profiles

This section profiles a select group of private companies that are in the business of developing cutting-edge technologies. Companies were selected on the basis of the track record of their founding scientists, the novelty and breadth of application of their technologies, and potential for access to defined and lucrative target markets.

Cellzome

Fishing around for proteins

Almost all diseases can be traced back to one or more malfunctioning protein, which in turn may be suitable targets for therapeutic intervention. However, many proteins do not act alone, instead forming complexes with various other molecules. Cellzome believes that by concentrating on the intimate relations between proteins, using its novel means of studying protein complexes, it can become a leader in the discovery of novel drug targets.

Cellzome aims to take any protein and determine the proteins with which it associates using a process called tandem affinity purification (TAP). TAP was developed by researchers at the European Molecular Biology Laboratory (EMBL; Heidelberg, Germany) and initially tested in yeast (*Nat. Biotechnol.* 17, 1030–1032, 1999). Yeast are engineered with an open reading frame (ORF) such that the encoded protein contains a tag that allows it, along with all the other proteins with which it is naturally associated, to be fished out using chromatography. The bound proteins can then be identified using mass spectrometry, and clues to their possible function obtained using various databases and bioinformatics tools.

Cellzome intends to tag each of yeast's ~6,000 ORFs to create a protein-interaction map of the entire organism. And it is close to achieving this goal. The firm recently published a yeast protein-interaction map, which examined 1,739 ORFs, including 1,143 human orthologues, and described 589 purified protein assemblies (*Nature* 415, 141–147, 2002). The authors proposed new cellular roles for 344 proteins, including 231 that had no previous functional annotation. CEO Charles Cohen says that Cellzome has now completed analysis of ~4,500 ORFs, and the company plans to make a comprehensive protein-interaction map freely available on the internet.

Cellzome's headquarters on the EMBL campus.

The yeast map proved to potential partners just what Cellzome's technology was capable of; the company is now using this approach to identify orthologous complexes in mammalian cells and in other model organisms.

TAP is protected by pending patent applications (the first will be issued in June 2002), but the company has made the technology available to academic investigators, although the license contains patent reach-through terms that may discourage certain investigators. Cellzome is confident of success, because of the firm's exceptional research staff, its ability to develop protein interaction maps in a high-throughput manner, and its access to expert advice from other researchers on the EMBL campus.

Cohen says that the ultimate goal is to turn Cellzome into a full-fledged pharmaceutical company. The company will therefore study various human cell types more relevant to drug discovery. For example, the firm can take 10–15 proteins involved in disease-related pathways and use TAP to create a protein-interaction map to identify novel targets.

In the near future, Cohen anticipates collaborations with firms that have technologies that can validate its targets. The company hopes to double in size by 2003 as it builds its drug-development capabilities—medicinal chemistry and preclinical expertise, for example. *AB*

Founded: May 2000
Founders: Charles Cohen (President and CEO), Stelios Papadopoulos (Chairman), Spyros Artavanis-Tsakonis, Giulio Superti-Furga, Gitte Neubauer, Peer Bork, Rudiger Klein, Angel Nebreda, Bertrand Seraphin, Matthias Wilm, Luis Serrano, and Cayetano Gonzalez
Employees: 120
Financing to date: $39 million from Atlas Venture (Amsterdam), Advent International (London), Heidelberg Innovation (Heidelberg, Germany), Index Ventures (Geneva), Sofinnova Partners (Paris), and Schroder Ventures (London)
Location: Heidelberg, Germany
http://www.cellzome.com

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