The Changing Requirements for Informatics Systems During the Growth of a Collaborative Drug Discovery Service Company

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Overview

- History of BioFocus and acquisition of CDD
- Biological Informatics Systems
- Chemoinformatics Systems and Recent Developments
  - Move local databases to Oracle and ISIS/Host
  - Implement compound ordering and management system
  - Tools for HTS library analysis
  - ADMET properties prediction
  - Virtual library builder for chemists
  - FARsight™ – knowledge management tools for GPCR collaborations
Key Financial Dates

- **Launch of BioFocus on London Ofex market** – March 1997 – Raise $1.8M
- **Become profitable** – 1999
- **Move to London Stock Exchange AIM market** – August 2000 – Raise $6M
- **Acquired CDD** – June 2001
- **2001 results** – Turnover $15M – Profits $3.03M
Our 3 Sites

Cambridge Science Park
- Biology labs
- Previously CDD

Chesterford Park
- Chemistry labs
- Business Development

Sittingbourne Research Centre
- Chemistry labs
- Headquarters and Registered Offices
Our Initial Business Model

Chemistry Collaborations

Hit-to-lead
Lead optimisation
Custom libraries
Computational chemistry
QSAR
SoftFocus libraries
Our Current Business Model

Chemistry Collaborations
- Hit-to-lead
- Lead optimisation
- Custom libraries
- Computational chemistry
- QSAR
- SoftFocus libraries

Biology Collaborations
- Assay Development
- HTS
- 100K screening library
- Selectivity screens
- BioInformatics

Full Drug Discovery Collaborations
Informatics Skills

BioFocus

- Computational chemistry
- QSAR/statistics
- ISIS Base (and Host)
- SG Unix
- Programming skills
  - SAS
  - SPL
  - awk

Cambridge Drug Discovery

- BioInformatics
- Oracle
- SUN Solarix
- Programming skills
  - Java
  - C++
  - Perl
  - Daylight
Biology Informatics Systems

- **TargetBase™ (BioInformatics curated database)**
- **RS³ from Accelrys for handling screening data**
- **Problems handling 384-well plate data**
- **Moved to ActivityBase Jan 2002**
Early ChemoInformatics Systems

- Corporate database – Accord for Access
- Pharmascape™ (scaffold database) – Accord for Access
- Individual client databases – ISIS Base
- SoftFocus libraries databases – ISIS Base
- Monomer database – ISIS Base
Corporate Database (Accord for Access)
PharmaScape™ (Accord for Access)
SoftFocus and Client Databases (ISIS Base)
Recent ChemoInformatics Developments

- Move databases to Oracle and ISIS Host
- Implement a computerised compound ordering and tracking system (CIMS)
- Tools for development of HTS library
- ADMET predictive toolbox
- Develop library building tool for synthetic chemists
- FARSight™ – GPCR knowledgebase and design tools
The Oracle System

- SoftFocus libraries
- Client databases
- Corporate database
- Monomer database
- PharmaScape™
- ISIS Host
- Accord for Access
- Oracle
How best to Achieve the Transition?

Problems

- Limited in-house expertise in Oracle and ISIS Host
- Insufficient time to develop expertise

Solution

- Collaborate with MDL to achieve results
The BioFocus-MDL Collaboration

- **Transfer of ISIS Base databases to Oracle/ISIS Host environment**
  - Nearly complete

- **Transfer of Accord for Access databases to Oracle/ISIS Host environment**
  - To be done

- **Compound Information Management System – CIMS**
  - Customisation for BioFocus requirements complete
HTS 100K Compound Library Development

- Property profiling to define limits, standard deviations, medians and means (ClogP, MWt, No. O+N, No. OH+NH, PSA, No. fingerprint bits set, No. rotateable bonds, etc.)

- Identification of reactive groups (M. Hann et al)

- Identification of toxophores (under discussion)

- Identification of restricted compounds (HSE)

- Diverse………. but not too diverse

- Purchasing compounds individually and by plate
ADME Toolbox Project

Collection of tools to support decision making in hit-to-lead, lead optimisation and library design projects

- Property calculations for ADMET (ClogP, Log D, MWt, No. O+N, No. OH+NH, PSA, solubility etc.)
- QSAR equations and models for protein binding, absorption and BBB penetration
- P450 models and pharmacophores
- Identification of potential toxophores
- Links to MDL’s Metabolite and Toxicity databases
Library Builder for Chemists
Library Builder for Chemists

- Synthesize library
  - Yes: OK?
    - No: View library profile
    - Calculate properties
- Monomer lists
- Revised monomer lists
- Build virtual library
- Filter
Library Builder for Chemists
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Library Builder for Chemists
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