

***CHALLENGES OF TODAY'S
PARADIGM FROM A CRO
PERSPECTIVE. THE CHANGING
BUSINESS RELATIONSHIPS: ARE
CONTRACTS LIMITING SCIENTIFIC
FREEDOM?***

Stuart McDougall

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CRO; Bioanalytical Services

Traditionally, a CRO offers 'bioanalytical services' to the customer, made up of technical skill, facilities, instruments, resource and knowledge.

Bioanalytical Small Molecule

- ▶ **Bioanalytical**
 - Global harmonized platforms
 - Standard operating procedures
 - Automation (liquid handling and sample extraction)
 - Software (mass spectrometry and LIMS)
 - Instrumentation (mass spectrometry)
 - Method development, feasibility, transfer, validation and sample analysis with scientific and regulatory expertise
 - Biomolecule analysis by LC-MS/MS
 - Peptide
 - Protein
 - Oligonucleotide
 - Regulated biomarkers
 - Deid Matrix Spot analysis and liquid microsampling
 - Whole blood
 - Plasma
 - Urine
 - Cerebral spinal fluid
 - Other biological fluids
 - Chiral drug assays
 - Elemental analysis by ICP-MS (center of emphasis - Alswick, UK)
 - ACDP level 3 certification for handling dangerous pathogens (Alswick, UK)
 - Tissue sample analysis
 - Chemical derivatization sample preparation
 - Nonclinical toxicokinetic (TK) and pharmacokinetic (PK) studies
 - Clinical PK and bioavailability studies
 - Single and multiple ascending dose
 - Late stage clinical

Bioanalytical Small Molecule

- Bioequivalency studies
- Therapeutic drug monitoring studies
- Drug/drug interaction studies
- Nonclinical and clinical PD studies
- ▶ **Analytical instrumentation and automation**
 - Chromatographic: UHPLC, HPLC
 - Mass spectrometric: LC-MS, ICP-MS, FAIMS
 - Spark Holland Synthesis™ Pharma on-line solid phase extraction
 - Cohesive Technologies TurboFlow®: on-line sample extraction
 - Anachem Flexis® DMPE liquid handling system
 - BDD60-Duet: automated dried blood spot punch
 - TOMTEC QUADRA96®: liquid handling system
 - Hamilton liquid handling systems
 - MICROLAB® STAR
 - MICROLAB® NIMBUS 96
 - Thermo Fisher Scientific - Watson LIMS™
- ▶ **Organic synthesis for reference standards and stable-labeled internal standards with certificate of analysis**
- ▶ **Full chain-of-custody sample tracking utilizing flag label bar codes**
- ▶ **Ability to handle controlled substances**
- ▶ **Integrated data reporting templates to reduce report generation times**
- ▶ **On-line study management using StudyTracker®**

Bioanalytical Large Molecule

- ▶ **Bioanalytical**
 - Method development, feasibility, transfer, validation and sample analysis with scientific and regulatory expertise for nonclinical and clinical studies
 - Nonclinical TK studies
 - Clinical PK and bioavailability studies
 - Immunoassay studies using a tiered approach
 - Screening
 - Confirmatory (immuno-depletion)
 - Titer assessment (quantification)
 - Cell-based and ligand-binding neutralizing antibody detection
 - Bioequivalency studies
 - Biotinidase expertise
 - Biomarker expertise
 - ELISA (absorbance, fluorescence and luminescence)
 - Electrochemiluminescence (ECL)
 - Radioimmunoassay (RIA) (Beta and Gamma)
 - Gyne immunoassay lab system
- ▶ **Fully GLP validated equipment and software**
 - MSD Sector Imager 6000
 - VersaMax 96-well plate reader
 - Gyne immunoassay lab system
 - SpectraMax 96/384-well plate readers
 - SpectraMax MS plate reader
 - Hamilton MICROLAB® STAR liquid handling system
 - Tecan® EVO200/TeMO
 - Walkac MicroBeta® Trisun

Bioanalytical Large Molecule

- Thermo FISH Apex Gamma Counter
- SoftMax Pro 6.3, 5.2 and 4.3.1 Enterprise
- Thermo Fisher Scientific - Nautilus LIMS™ 8+
- Thermo Fisher Scientific - Watson LIMS™ 7+
- ▶ **Full chain-of-custody sample tracking utilizing flag label bar codes**
- ▶ **Extensive assay development and validation expertise for ELISA, ECL, RIA, Gyne and cell-based assay formats**
- ▶ **Ability to handle controlled substances and genetically modified organisms**
- ▶ **Integrated data reporting templates to reduce report generation times**
- ▶ **Automated pipetting system interfaced with Watson LIMS™**
- ▶ **On-line study tracking using StudyTracker®**
- ▶ **Electronic documentation and auditing capabilities**
- ▶ **Regulatory expertise**
- ▶ **Highly qualified study management for personalized scientific communication**
- ▶ **Global state-of-the-art facilities**
 - Chantilly, VA
 - Harrogate, UK
 - Shanghai, China

The customers traditionally see the CRO as 'a service provider'.

Changing Landscape

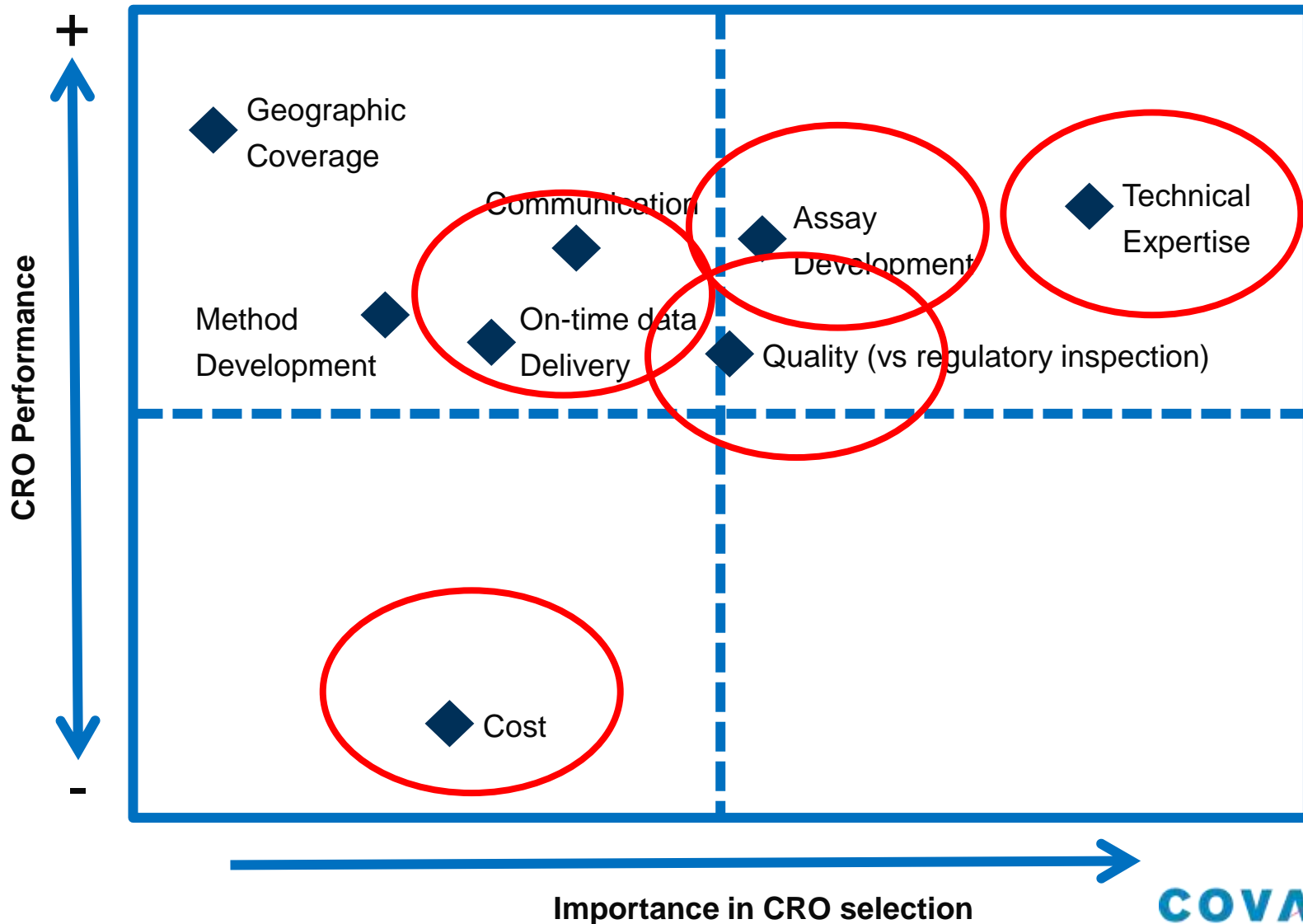
- Changing Business Drivers; FIPCO vs FIPNET
- Variety of clients; virtual, small, mid, large, consultants and other CROs
- Variety of CRO types; 'Full Service' vs. 'Niche'

Different outsourcing models;

- Transactional
- FTE (dedicated headcount agreements)
- Preferred Partner
- Alliance



Pharma / CRO interface; understanding your needs



Pharma and CRO Interface; Contracts

Legally binding commercial contract defines Scope of Work.

Limits liabilities

But can limit freedom for rapid change in direction (driven by science)

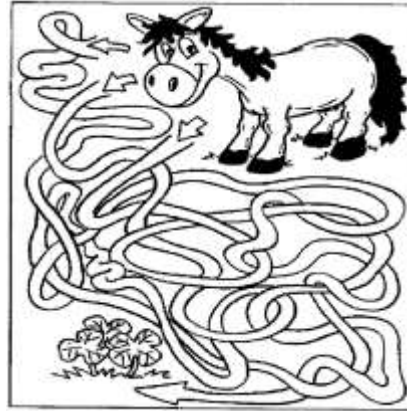
Both Pharma and CRO need creativity and flexibility to adapt to change and meet shared goals



Understanding each other

Bioanalysis is science

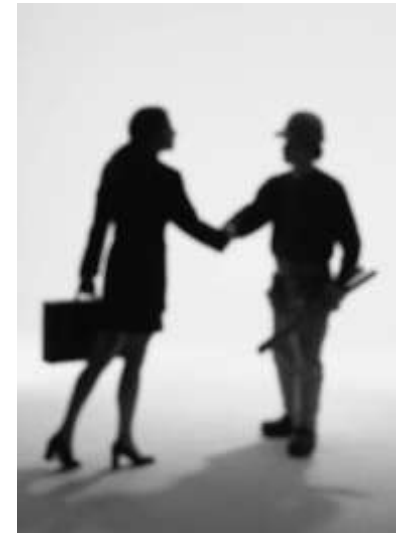
- Science takes time
- Quality takes time
- The path may change!



Need creativity and flexibility, which may be contrary to established processes (change)



Clear communication is a key requirement
Outsourcing any bioanalysis requires trust



First steps....

*'The true sign of intelligence is not
knowledge but imagination'
(Albert Einstein)*

Let us imagine different ways of
working between Pharma and CRO