What is a Technology Transfer in Pharmaceutical Contract Manufacturing?
Overview

• Introduction
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Introduction
Technology Transfer Introduction

• Most important link in supply chain
• Importance of the process
• Objectives
• Technology Transfer process
• Requires a good relationship
What is a Technology Transfer?
A technology transfer is what happens when a pharmaceutical company wants to change from an existing manufacturing site to a new manufacturing site.
Initial Steps: Assumptions raw materials and Active Pharmaceutical Ingredient (API) remain the same and procured from the same suppliers

• Assess original manufacturer’s information
  – Raw materials
  – Critical process parameters
  – Equipment
  – Batch size
Scale-Up and Post Approval Change (SUPAC) Guidelines and Regulatory Strategy

- FDA guidelines
- SUPAC charts
- Best technical transfer
- Different size, class or sub-class
Make Sure Transfer Protocols are Developed to Capture the Process Thoroughly

- Develop transfer tools
- Develop a thorough process
- Move to validation
4 Key Items That Also Need to be Challenged to Ensure a Successful Technology Transfer

- Packaging line trials
- Stability indicating methods in place
- Cleaning validation
- Health and safety review
Technology Transfer

- Handover of knowledge between organizations
- Internal transfer
- Transfer between two or more corporate identities
- Lateral transfers
- Successive life cycle stage
Tech Transfer Issues

- Inconsistencies and miscommunication between donor and receiving organization
  - Materials
  - Equipment
  - Disciplines
  - People
  - Culture
  - Physical
  - Biological
  - Interpersonal factors
External Transfer

- Two-prong approach
- CMO’s work with many products and technologies
- Request for proposal (RFP)
- Demo or engineering batch
Ready for Kickoff

- Structured and documented meeting
- Assembles detailed tech transfer list
- Specific, anticipated issues
- Issues
- Gap analysis
- Transfers between CMOs through sponsor
Internal Transfers

- Organizations treat collaborations differently
- More relaxed
  - Internal customers not viewed as real
  - Common tasks taken for granted
  - Cautions might be ignored
  - Technology is unfamiliar to manufacturing group
Failure to Scale

• Development use equipment that do not scale
  – Larger equipment may be unavailable
  – Mixing or mass transfer problems
  – API too expensive

• Needs experienced manager
Analytical Methods

- Assuring chemical identity and purity
- Issues may stall when skills differ
- CMOs may outsource to external labs
- Conduct parallel test on same samples
- Equipment should be well-matched
- Formal qualification/validation protocol
Ensuring a Smooth Start
Two Main Items Required by the Client

• Clearly defined project scope requirements
• Complete document package
Clearly Defined Project Scope

- Eliminates guesswork
- Can be a comprehensive Request for Quotation
Complete Technology Transfer Document Package

- Define project scope upfront
- Identify required activities for the quote
- Minimize inaccuracies in the quote
- Eliminate inefficiencies
- Expect any changes that may delay timeline
Once client approves a tech transfer quotation, they submit a purchase order for project deliverables, a project manager will be assigned.
Project Manager Roles

• Schedule project introductory meeting
• Review quote and purpose of project
• Brainstorm and identify tasks
• Identify requirements and action items
• Publish meeting minutes
• Monitor tracking of project tasks
Analytical Method Transfer for Products
The analytical method transfer is a documented process designed to verify a certain laboratory capability of performing the analytical testing method’s intended use.

Analytical method transfers are performed for validated methods for which complete analytical methods and validation data are available.
4 Common Test Categories for Method Validation

- Category 1: Quantitation of major components
- Category 2: Impurities in bulk substances
- Category 3: Performance characteristics
- Category 4: Identification tests
8 Analytical Method Performance
Characteristics that Must be Challenged

• Accuracy
• Precision
• Specificity
• Limits of detection (LOD)
• Limits of quantification (LOQ)
• Linearity
• Range
• Ruggedness
Pre-Approved Protocol

• Analytical method transfer defined and driven by
• Must have clear objectives
• List all necessary materials and procedures
• Cover acceptance of material
Primary Report

- Needs to be summarized, written up and approved by receiving laboratory and transferring laboratory
Method Validation

• Have a validated method to transfer
• Old methods may have different standards
The Cost of a Tech Transfer
Technology transfer can be considered successful if the receiving unit can routinely reproduce the transferred product, process or method against a predefined set of specifications as agreed with a sending unit and/or a development unit.
How Can We Increase the Chance of Success?

- Open communication
- Access to relevant information
- Understand responsibilities
- Address environmental concerns
- Validate analytical methods
- Audit material suppliers
- Correct documentation

- Understand regulatory strategy
- Review equipment
- Understand strategy
- Ensure sites can perform process adequately
- Process runs as expected on time and on budget
Technology Transfer
Show Stoppers

- Absence of clearly defined responsibilities
- Lack of communication
- Problematic analytical methods
- Inaccurate documentation
- Failure to perform detailed assessment
- Standards and procedure not clearly defined
- Improper planning
Associated Costs of Technology Transfer

- Varies based on complexity and specifics
- Regulatory fees
- Legal fees
- API is supplied to CMO
- CAPEX
- Times
- Studies
Successful Due Diligence when In-Licensing
Review As Much Technical Information As Possible On:

- Manufacturing and packaging process
- Quality control
- Quality assurance
- Regulatory and logistic
- A detailed checklist
Elements to Look for in a Technical Package

• Analytical methods
  – Needs to be current to today’s regulatory standards

• Supply of API
  – Available?
  – Reliable?
  – Lead times?
  – Discussion with supplier
Experienced Technical Knowledge

- Development reports
  - Documented well?
  - Is there a report?
- Is there alcohol use?
- Specific equipment required?
- Excipients available?
- Process parameters developed well?
- CMO experts can find potential issues
Review the Product’s Complaint History

• Potential manufacturing issues
• FDA 483s issued?
• Commitments to regulatory agencies
Feasibility Studies and Their Use in the Industry
Develop a Feasibility Plan

• Experiments to be performed
• Nuanced designed to elucidate
• Materials to be used
• Equipment
  – QbD: Quality by design
  – Challenge variables
Assessment of the Experiment

- Review written comments
- Visual observations
- Means of recording and documenting
- Review batch record
- What worked/didn’t work?
- What modifications are required?
Benefit of Small Scale Batch

• Can be put on 6 month accelerated stability
• Use for analytical development
• Packaging trials
• Optimize critical parameters
  – Mixing speeds and times
  – Drying times and parameters
  – Tablet compression
  – Coating
How Process Validation Guidance Simplifies Tech Transfer
New Process Validation (PV) Guidance issued by FDA in January 2011
3 Major Stages of Process Validation

- **Stage 1:** Process Design
- **Stage 2:** Process Qualification
- **Stage 3:** Continued Process Verification
IQ, OQ and PQ – What are They And Why are They Required?
Installation Qualification (IQ)

- Equipment material
- Test for residue
- Motors
  - Confirm requirements are consistent with specifications
  - Facilities can accommodate power source
Operational Qualification (OQ)

• Make sure equipment runs the way it should
Performance Qualification (PQ)

- Challenge with product under load
Why Are They Required?

• Method of establishing documented evidence that shows that we have a high degree of assurance that our manufacturing process will consistently yield a product of predetermined quality

• Otherwise:
  – It can cost client hundreds of thousands of dollars
  – Increase risk of product recall
  – Loss of market share

• Prevent by controlling change
Questions?

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