Contracted Manufacturing for Cell therapy

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ASGCT 2010
May 17, 2010
Disclosure

• Consulting fee from KM Pharmaceutical Consulting LLC as President and Founder.
Drug/Biologics Development

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<th>Discovery / Development</th>
<th>IND Enabling</th>
<th>Clinical Trial</th>
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<tr>
<td>Basic Research</td>
<td>&lt;GLP studies&gt;</td>
<td>Clinical Trials</td>
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<td>POC studies</td>
<td>- Toxicology / Safety</td>
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<td></td>
<td>- Biodistribution (cell fate)</td>
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- Research
- Process Development
- GMP setting

△ Pre Pre-IND meeting

△ Pre-IND meeting

△ IND-Filing

Manufacturing clinical lots
What do you need to do before IND?

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| Optimize product using screening system | Source controls  
Control of Raw Materials Quality  
Manufacturing Process Controls  
Detailed Product Characterization |  |
| Optimize process |  |  |
| - Stability test  
- In-process and final product release testing development  
- Final product packaging and delivery study  
- GMP documentation |  |  |

• Biologics manufacturing is technologically complex, high regulated process in comparison to small molecule manufacturing  
• A product is defined by process
Options for manufacturing

• Own manufacturing facility

• Not own manufacturing facilities
  – Commercial Contracted manufacturers (CMOs)
  – Academic facilities
Advantage of CMOs

• You can use the expertise CMO already established for particular kind of product (cell product, gene therapy, antibody etc.).

• You don’t need to invest to build your own full manufacturing facility for your product (especially in early development stage).

Cost, Resource and Time saving
Process for CMO selection

Example:

1. Select potential CMOs (3-4 candidates)
2. Execute CDA
   Provide the project summary (timeline, task etc.)
3. Review and Compare proposals including estimated costs
4. Audit
5. Final Selection
Key Factors to select CMOs (1)

• What **stage** are your product at?

• What kind of **task** do you need to contract out?
  – Simple Tech transfer?
  – Include process development?
  – Up to commercial product?

• What is your **requirement**?
  – Timeline
  – Cost
Key Factors to select CMOs (2)

- Does CMO have **Capability** to meet your requirement?
  - Extensive technical expertise and technology platform
  - Experience and track record
  - Facility (meet all requirement)
  - SOPs
  - Dedicated, Experienced Project Management
  - Resource and turnover
  - Financial security
Audit for CMO selection

The audits should be conducted in order to evaluate the facilities, critical systems and controls with regards to compliance with cGMP for manufacturing.

- Facility Design, Construction, Access and Flow
- HVAC System/Air Classification/Pressure Differentials
- HEPA Filter Preventative Maintenance/Recertification
- Environmental Monitoring
- Facility Cleaning
- Material Control
- Deviations, Corrective and Preventive Action (CAPA)
- Personnel Training
- Document Control
- Facility and Equipment Validation etc.
How to work with CMOs

Need to work as team

• Share the goal and timeline (from each task to whole development plan)
• Share the information
• Good communication
Conclusion

Biologics-focused CMO is one of good options for Pharma/bio-tech companies especially in early stage development.

Need to select the CMO carefully to meet your requirement and goal
Presenter Disclosure
Minako Koga

The following relationships exist related to this presentation:

KM Pharmaceutical Consulting LLC,
Consulting Fee, President/co-founder