The External Sourcing of Technological Knowledge by US Pharmaceutical Companies: strategic goals and inter-organisational relationships

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Objectives of the Paper

1. Study degree of strategic orientation and motivations for external knowledge sourcing.
2. Examine the nature of inter-organisational relationships developed
3. Capture the impact on organisational configurations of important industry/technology dynamics.
Propositions

1. External knowledge sourcing is motivated by a diversity of often conflicting objectives.

2. The search for new technological knowledge entails a complex mix of strategic intent and opportunistic behaviour, triggered by the special circumstances of innovation races.

3. Network relationships between organisations display a complex mix of network styles, comprising market, relational and/or hierarchical characteristics.

4. Tensions between managerial objectives and styles of inter-organisational relationships lend a dynamic to relationships that is expressed in re-alignments of network style.
Sources

Primary data:
- in-depth qualitative interviews with senior US LPC executives in or close to R&D
- in-depth interviews with some larger US biotechs

Secondary data:
- Publicly available data on external knowledge sourcing for the 12 largest US companies, including annual reports, company web sites and specialist industry data bases.
Innovation networks and the technological environment:

I. Factors promoting external knowledge sourcing

Depleted drug pipelines and shareholder pressures to fill them.

Pace of technological change + rising costs + high risks = a challenge to the vertically integrated model of LPCs

Emergence of niche specialist firms and a dynamic biotech sector ⇒ ‘knowledge labour’ segmentation between NBFs and LPCs and opportunities for greater external sourcing of knowledge by LPCs
II. Types of Research Partnerships

- Technology collaboration
- Research collaboration
- In-licensing
- Acquisition
III. Trends in external sourcing of knowledge by LPCs I

Increasing importance of in-licensed drugs

But in-house discovery remains more important

Stage of In-licensing

‘...we, like many other companies, are moving to earlier and earlier stage licensing because of the dearth of late-stage opportunities and the intense competition that’s growing in our arena... So probably people, if they had a choice, would have a later stage, but it’s more difficult to find the range of opportunities the company really wants.’
Trends in external sourcing of knowledge by LPCs II

Record on in-licensing investment returns is hazy

Absolute costs of external sourcing are rising…

…and bring added management control burdens

But the overall success rate of in-licensed drugs appears to be higher than that of in-house compounds

Explanation: differential scrutiny of internal and external projects may be the explanation
Theoretical considerations

1. Core and complementary capabilities: an ambiguous distinction

2. Networks and relationships between network partners
   a) relational
   b) calculative
Discussion of Empirical Results
Strategic or Opportunistic Network Management?

Contradictory Responses

‘In terms of setting the strategy for the company, we have recently completed a process where we have had therapeutic area planning teams developing, you know, not just a wonderful approach, but very clear: where are the best opportunities, where’s the best science, where the medical need, what do we project forward in competition, how could we do better.’

‘a third of our revenue comes from externally licensed products. And that is in the absence of a strategy to do it – it’s just been the old opportunistic “here is a good compound, let’s get it” approach.’
Quality of Inter-firm Relationships: calculative (market-type) or relational contracting?

1. Length of Relationships

‘No, [we do not have any particular companies that we frequently license from]. Whatever looks good.’

2. Business Transaction or Collaborative Learning?

‘You always want back-ups, so if this one does not work you go to the next one, and so you always want as many back-ups as you can’

‘It’s not just a bidding process, it’s not just who comes along with the largest cheque book …it’s the best partner …and one of the initiatives we are very sensitive to is, very early, through explicit questioning, we identify what the partner’s needs are, so that we can be sure that whatever we structure addresses their needs…’
3. In-licensing from Universities

‘Universities we are finding more and more difficult to deal with. Their intellectual property and development groups are actually far more obstructive than dealing with other companies – they are the worst people to deal with, the universities. They are really awful…and the expectations they have, “well we have discovered a molecule and we need hundreds of millions of dollars.”’
4. Power in the Network

The balance of power in the licensing relationship is both complex and shifting.

NBFs are becoming more assertive.

A new balance of power is evolving.

‘There has been an infusion of experience into the smaller companies, and therefore on the balance of a decade ago, where all experience was on the side of the large pharma [companies] and – I’ll state it in the extreme – all the innovation was on the side of the biotech company, that balance is much more on par in many cases... So I think those two factors have made it more relationships of almost equals.’
5. Transformation of the Network

Tensions in networks are leading to change.

New strategy: a stronger integration of strategic partners.

a. Repeat contracting

b. Ownership control
Conclusions

1. The explanation of external sourcing as a search for complementary knowledge is neither a completely reliable, nor is it always a sufficient explanation.

2. Firms’ search strategies therefore are not consistently guided by strong pre-existing preferences but often are shaped more opportunistically by market opportunity.

3. These motivations for external sourcing shape the nature of network relationships developed.
Conclusions II

4. Power in the Network: Accumulated tensions in network relationships, together with the changed scientific and business environment, have begun to transform network relationships.


6. How far has external sourcing of US LPCs been shaped by the institutional configurations of the US variety of capitalism?
<table>
<thead>
<tr>
<th>Technology collaboration</th>
<th>Research collaboration</th>
<th>In-licensing</th>
<th>Acquisition</th>
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<tbody>
<tr>
<td><strong>early stage (discovery)</strong></td>
<td><strong>mid stage</strong>&lt;br&gt;(preclin. / Phase 1)</td>
<td><strong>late stage</strong>&lt;br&gt;(Phase 2 onwards)</td>
<td><strong>compound-oriented biotech</strong></td>
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<tr>
<td><strong>Frequency</strong></td>
<td>very common</td>
<td>very common</td>
<td>increasingly common</td>
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<tr>
<td><strong>Type of partner</strong></td>
<td>biotech or university / research institute</td>
<td>biotech or university / research institute</td>
<td>biotech (rarely pharma)</td>
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<td><strong>Rationale</strong></td>
<td>gain access to new technology</td>
<td>early access to new compounds; enter new research area</td>
<td>plug pipeline gaps; spread risk on in-house research portfolio</td>
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<tr>
<td><strong>Nature of relationship</strong></td>
<td>exclusive licence for strategic technology; non-exclusive licence or purchase for routine technology</td>
<td>long-term; majority transition to licensing contract; positive experience may lead to other deals</td>
<td>usually case-by-case; positive collaborative experience may lead to other deals</td>
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<td><strong>Financial arrangement</strong></td>
<td>licence fee or fee-for-service</td>
<td>PhD funding or university lab funding; shared research costs</td>
<td>generic form is up-front fee, milestones and royalties; deals are increasingly complex; may include equity stake</td>
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<tr>
<td><strong>Locus of power in negotiations</strong></td>
<td>LPC</td>
<td>LPC</td>
<td>more balanced power relationship</td>
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