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Introduction

- A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (Porter, 1990).
Background and Objectives

• The Kansai region has **different range of knowledge competences** across the three cities (Osaka, Kyoto & Kobe)

• The region displays **a fragmented coordinating system** to manage and develop the biotech cluster

• Most small and newly formed firms struggle to **establish and maintain international alliances**

• Look for an optimal structure and some key factors for success (KFS) that promotes successful development in two European life-science clusters in comparison to the Kansai Bio-Cluster
Kansai (Japan)

- Kansai has 600+ firms
- Northern Osaka has a historical background of drug brokerage; Takeda Pharmaceutical Company Limited, Mitsubishi Tanabe Pharma Corporation, Fujisawa Pharmaceutical Co., Ltd. (present Astellas Pharma Inc.), etc. (Mishima, 1990)
- Kyoto was active in handicraft for temples which allowed the birth of precision instrument manufacture industry development and manufacture of physicochemistry machinery as well as foundation for higher education institutions such as Doshisha and Kyoto University
- Kobe has a conglomeration of health-related firms following the "Kobe Biomedical Innovation Cluster" framework in 1998 resulting to 14 core research/medical institutions and more than 200 health-related enterprises
Medicon Valley (Denmark & Sweden)

- It spans the greater Copenhagen area in Denmark and the Skane region of southern Sweden with nearly 400 firms

- Hosts two of the largest universities in Scandinavia Lund University (LU) and the University of Copenhagen (UC)

- Benefited from major funding from big organizations such as Carlsberg dedicated towards scientific researches

- A number of research-intensive and fully integrated pharmaceutical companies, such as Novo Nordisk, H. Lundbeck, AstraZeneca and LEO Pharma reside in the region

- Local research institutions and biotech firms strongly collaborate to link ideas and commerce
Lyon (France)

- Approximately 600 firms
- Home to large corporations such as Sanofi-Pasteur (human vaccines), Biomérieux (in vitro diagnosis), Merial (animal vaccines and drugs), Becton-Dickinson (European centre for drug delivery systems)
- It is amongst the 18 best ranked, high priority cluster projects in France
- LyonBiopôle has strong focus on strategic domains focusing on infectious diseases and vaccine therapy which has gradually enlarged to be more exploratory
- Also reside 18 prominent research and higher Education organizations (including Lyon University, 2 Inserm research centres and Centre Léon Bérard) and 3 university-hospitals
Hypothetical Framework for Comparison

H₁: Institutional capability building in coordination with cluster dynamics can contribute to the full use of the regional competitiveness

1A. Regional dynamics
- History/origins of the region/cluster
- Main actors with profiling and statistical information

1B. Institution
- Governance structure
- Supporting policies/initiatives

2A. Linkages
- Transfer of S&T knowledge among actors

2B. Networks
- Communications
- Supporting infrastructures

3. Competence
- Key knowledge competences and comparative advantages

Source: the Authors
### Key Points for the Case Evaluation Based on our Comparison Framework

<table>
<thead>
<tr>
<th>Component</th>
<th>Medicon Valley Region</th>
<th>Lyon Region</th>
<th>Kansai Region</th>
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<tbody>
<tr>
<td><strong>1A Regional dynamics</strong></td>
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<tr>
<td>□ Voluntary formation</td>
<td>□ Voluntary formation</td>
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<td>□ Voluntary formation (Northern Osaka/Kyoto region) and planned cultivation (Kobe region)</td>
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<td><strong>1B Institution</strong></td>
<td>□ Cooperation among enterprises</td>
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Key Points for the Case Evaluation Based on our Comparison Framework Cont.

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<tr>
<th>Component</th>
<th>Medicon Valley Region</th>
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<tr>
<td><strong>2A Linkages</strong></td>
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<td><strong>2B Networks</strong></td>
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<td>Central government plays</td>
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<td>plays leading role</td>
<td>and central government</td>
<td>leading role</td>
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<td>Cluster promotion</td>
<td>Industrial Cluster</td>
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<td>policy by government is</td>
<td>Project (2001-9)</td>
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<td>absent</td>
<td>Knowledge Cluster Initiative</td>
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Study Limitations

• This study is based on only two European cases, in order to make our argument more firm expansion to include other cases particularly from the United States may reveal more interesting results.

• Second, this study stops at qualitative comparison and evaluation, in order to entail a more precise comparison with quantification exploiting statistical information of each region may yield more concrete results.

• Third, there remains a fundamental problem of how to evaluate regional advantage or achievement of cluster formation which may be resolved through application of graded evaluation such as by analysing patent database (see for example Nishimura et al., 2009) or econometric analysis to explain the regional differences (see for example Valentin et al., 2004).
Conclusions

Our findings supports three main facts:

• Intra-industry and inter-firm networks mainly drives cluster uniformity and linkages amongst key actors

• A uniformed cluster hub organization plays a significant role for cluster management

• The three regions in the Kansai bio-cluster; Osaka, Kyoto & Kobe are impaired by sub-regional separation at a cluster management level that has been somehow interfering with the development plans
Recommendations

• Industrial clusters are the core of regional innovation system construction. More precisely, the effective formation of bioindustrial clusters is directly linked to the success or failure of life/innovation policy set forth by the government.

• We propose that the local bioindustrial actors in Kansai join forces to cultivate resources rooted in each region to develop the economy further.

• Our findings can assist the government to refocus its effort towards segmentation of this important field.
<table>
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<tr>
<th>Core members</th>
<th>Visiting members</th>
<th>Collaborators</th>
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<tbody>
<tr>
<td>Alfnoso Avila-Robinson</td>
<td>Koichi Nagasawa, Osaka City Univ.</td>
<td>Takanori Ida, KU-Econ</td>
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<td>Hawa Issa Munisi</td>
<td>Tomohiro Anzai, Univ. of Tokyo</td>
<td>Chihiro Suematsu, KU-GSM</td>
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<td>Mitsuya Sakurai</td>
<td>Ichiro Fujimoto, Yodoyabashi-Yamagami LPC</td>
<td>Naoki Wakabayashi, KU-GSM</td>
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<td>Keiko Azuma</td>
<td>Shino Kondo, Deloitte Tomatsu Consulting</td>
<td>Finn Valentin, Copenhagen Business School</td>
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<td>&amp; Shintaro Sengoku</td>
<td>Giancarlo Lauto, Univ. of Udine</td>
<td>Eric Jolivet, IEA Toulouse</td>
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<td>Zhongquan Xie, Wuhan East Lake High-tech Dev. Zone</td>
<td>Lars H. Alkarsig, Technical University of Denmark</td>
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