

ICSTI 2014

October 21, 2014 (Tue) 1130 – 1200

At Miraikan, Tokyo

Structures of creating breakthrough innovation

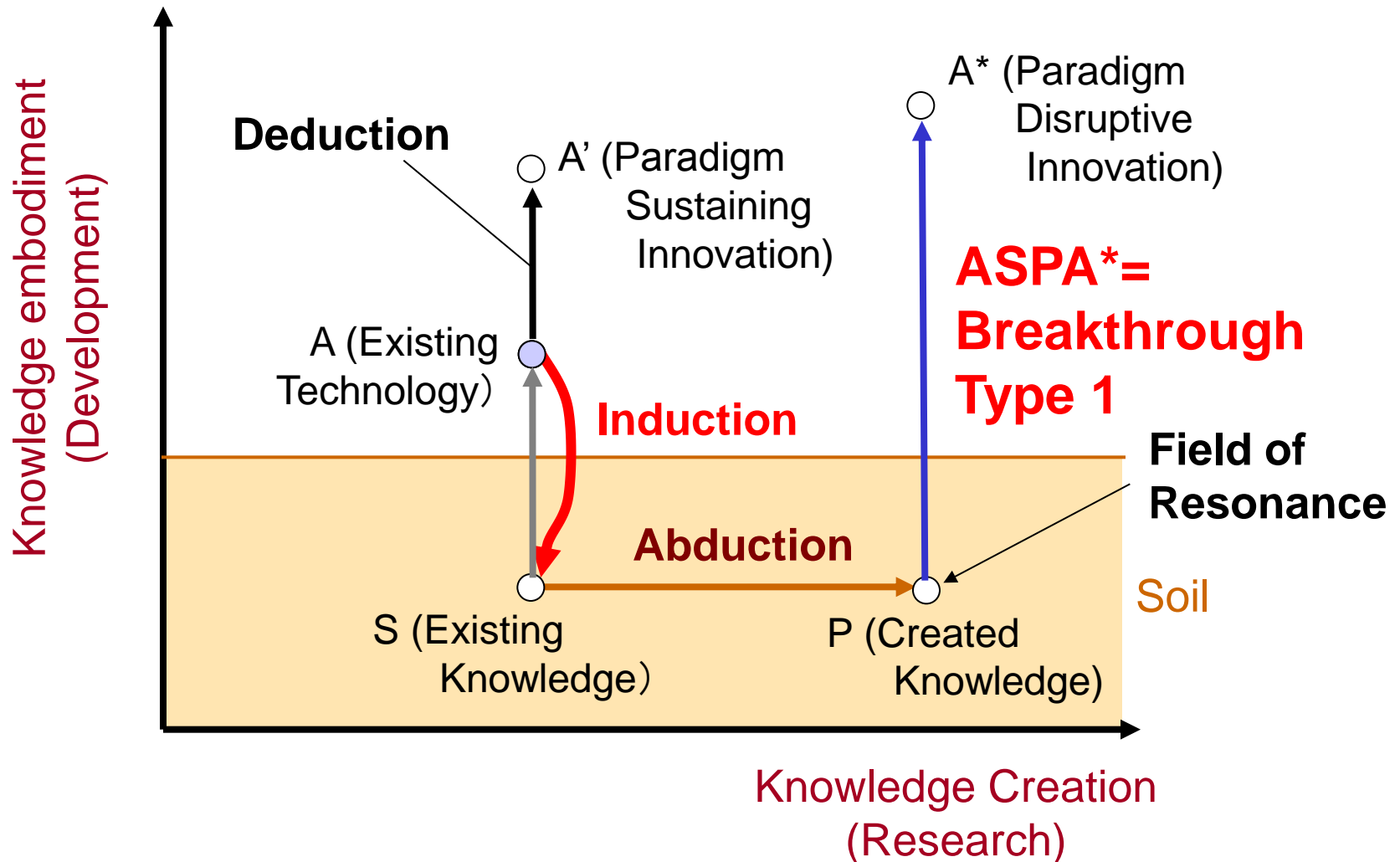
Eiichi YAMAGUCHI
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Kyoto, Japan



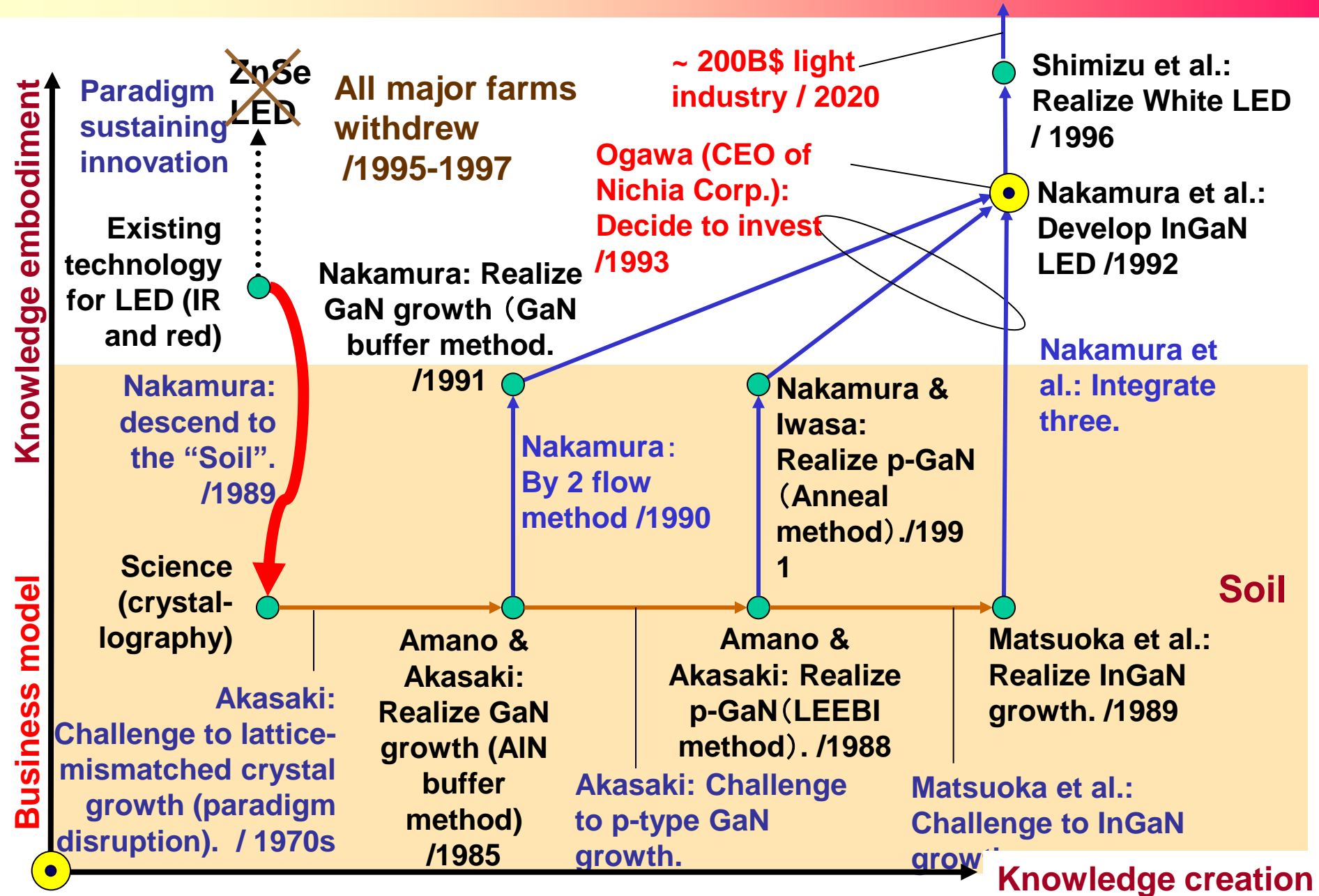
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- 1. General Theory for Breakthroughs**
2. Academic Landscape
3. Comparison of SBIR between U.S. and Japan on Academic Landscape
4. Comparison of SBIR Bio-medical Industry between U.S. and Japan

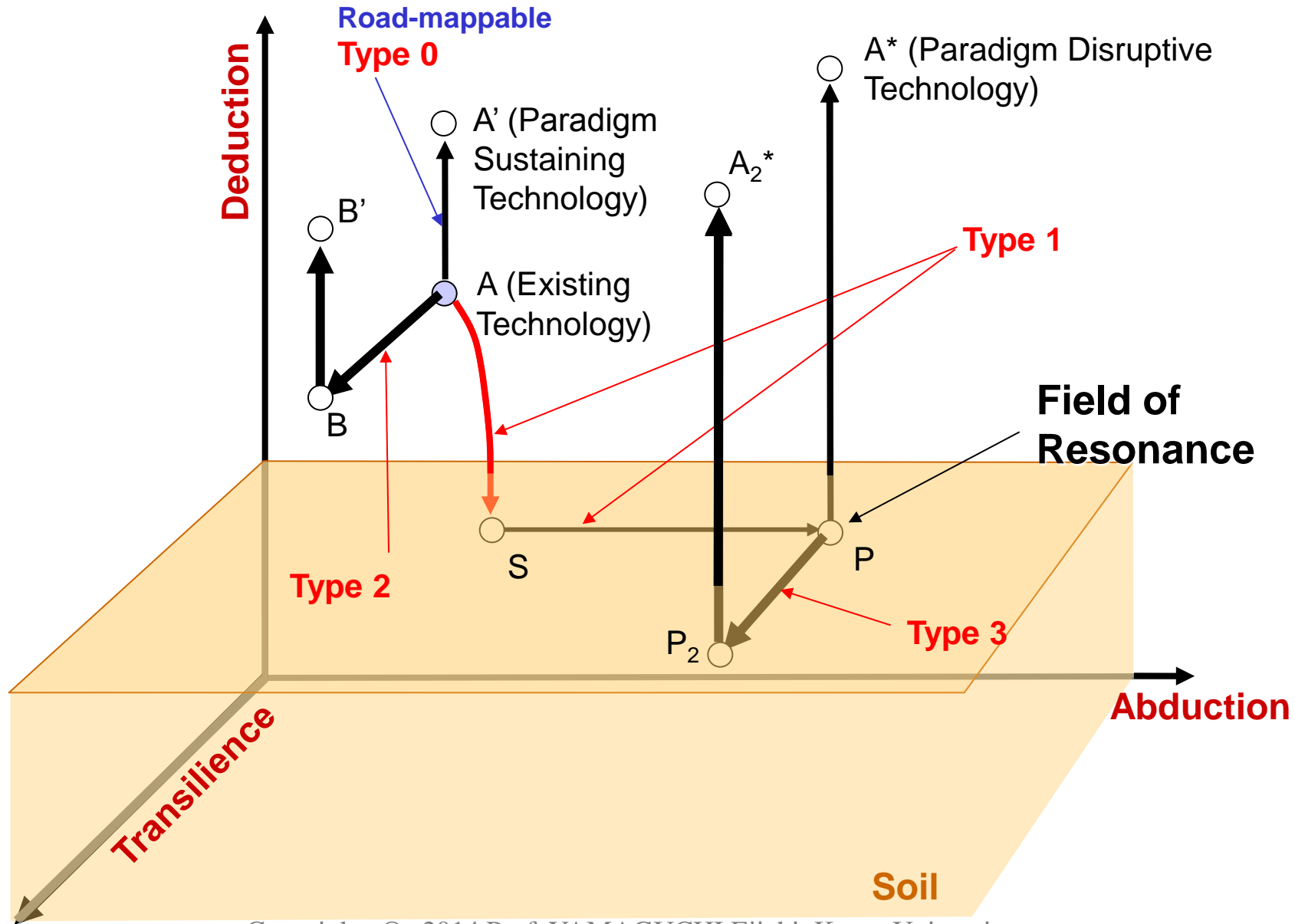
Innovation Diagram



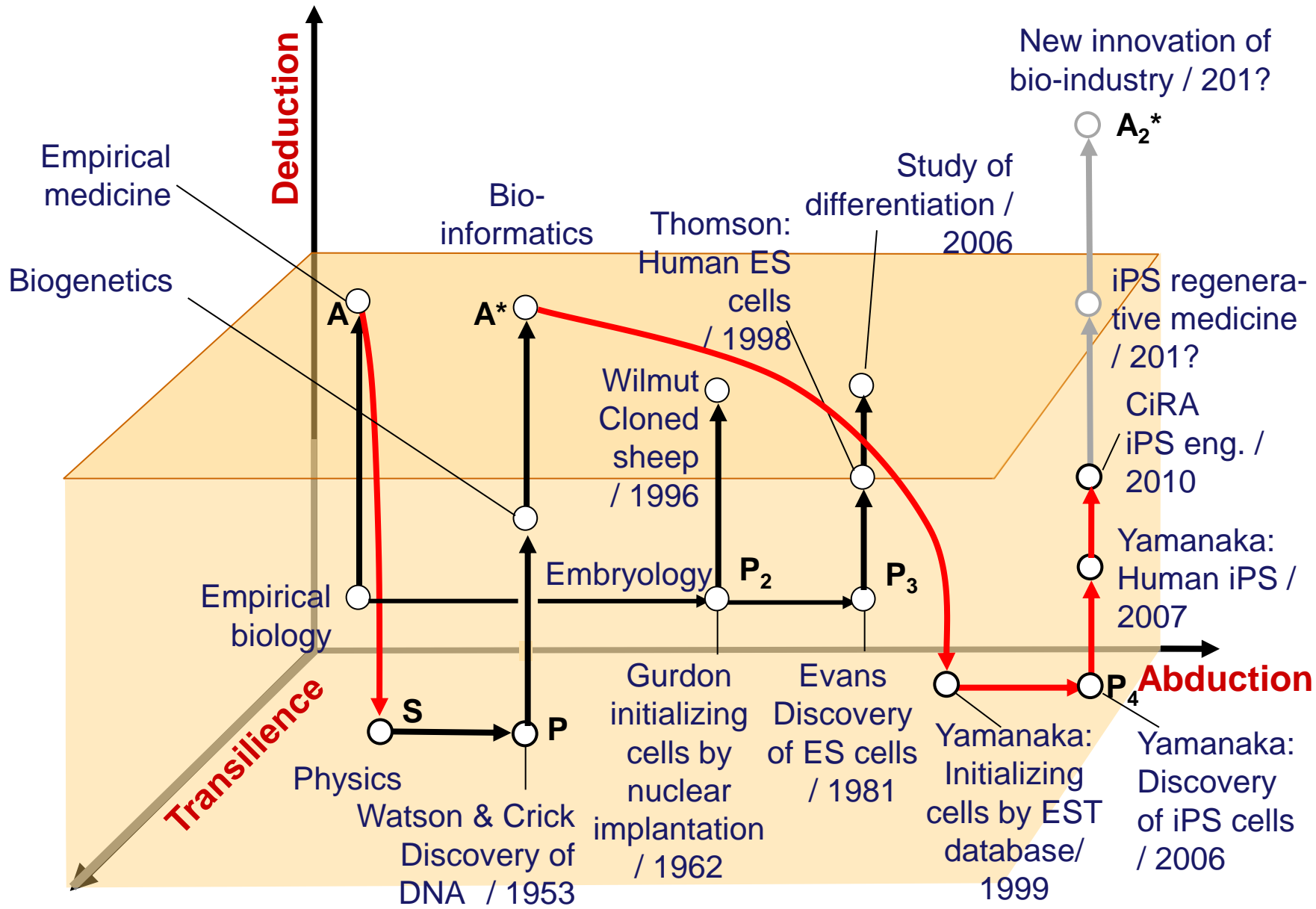
Innovation diagram: Blue LED



General Theory for Breakthrough



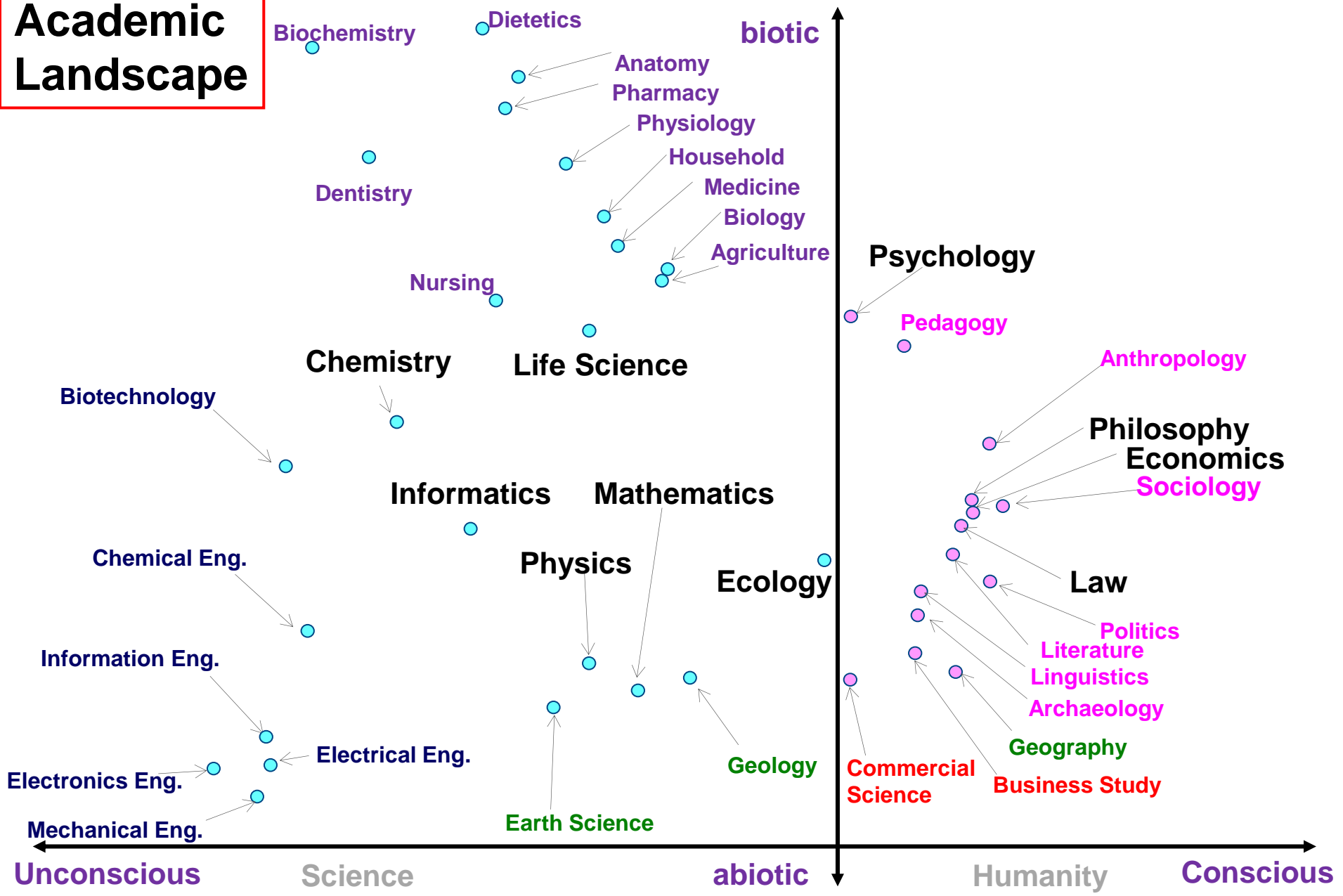
Innovation Diagram: iPS Cells



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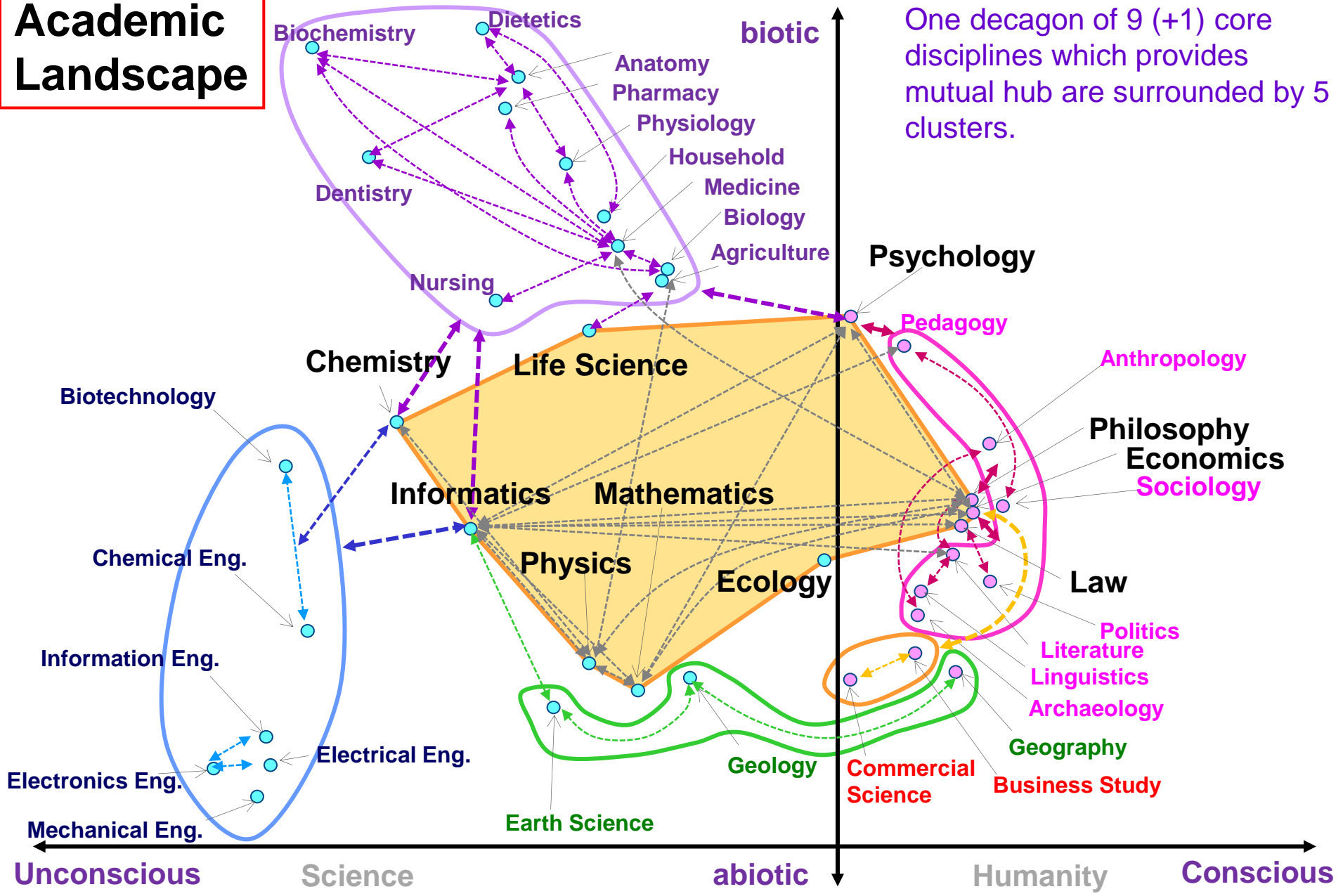
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Academic Landscape



by Y. Fujita, M. Kawaguchi and E. Yamaguchi

Academic Landscape

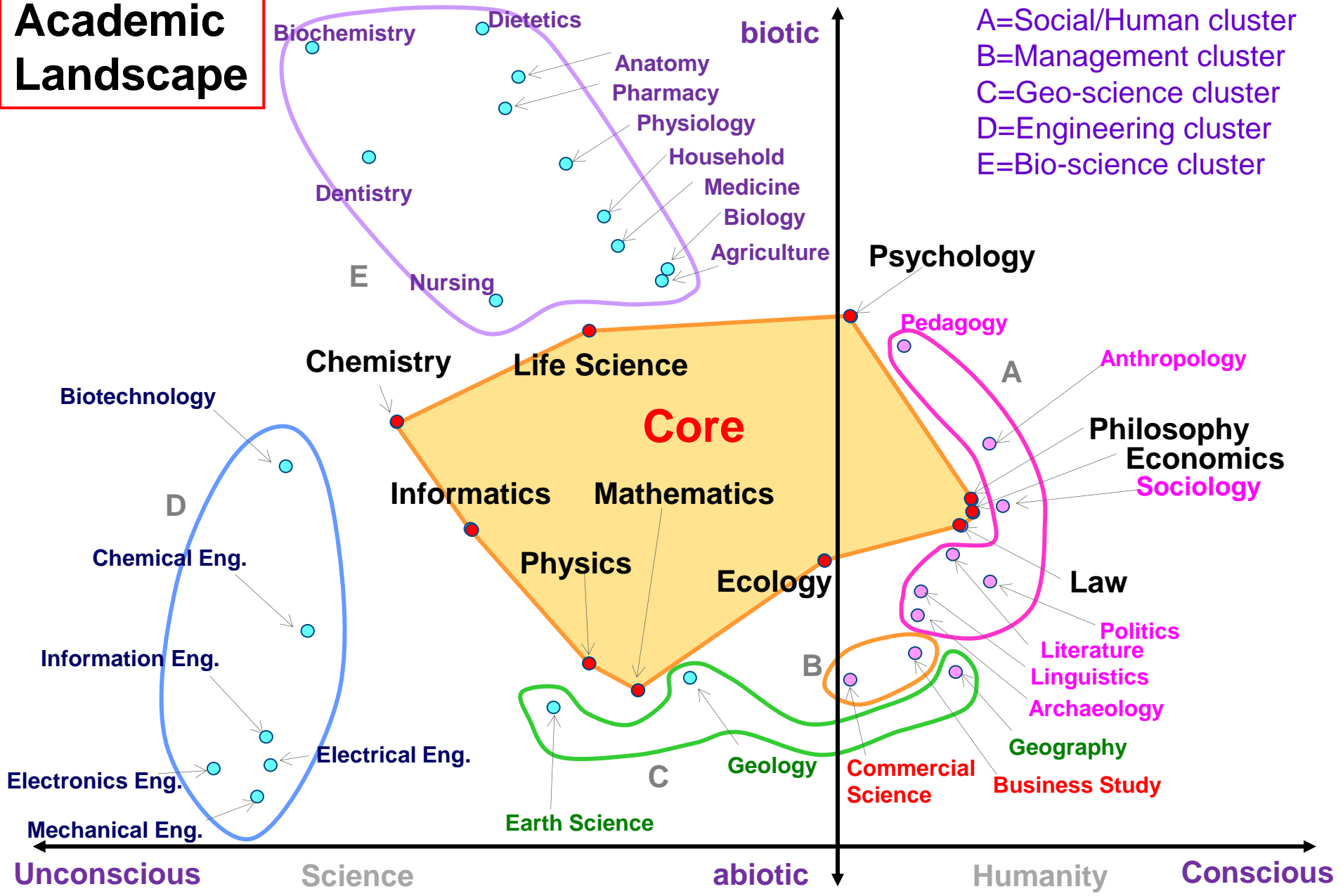


One decagon of 9 (+1) core disciplines which provides mutual hub are surrounded by 5 clusters.

by Y. Fujita, M. Kawaguchi and E. Yamaguchi

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Academic Landscape



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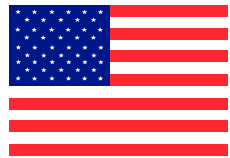
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What is SBIR Program? : U.S. and Japan

SBIR/STTR

SMALL BUSINESS INNOVATION RESEARCH
SMALL BUSINESS TECHNOLOGY TRANSFER

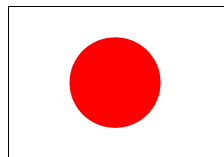


- U.S. started the SBIR program in 1982.
- Federal must set aside 2.5 percent of R&D funds for SBIR (\$2 billion / year).
- the process consists of three phases.

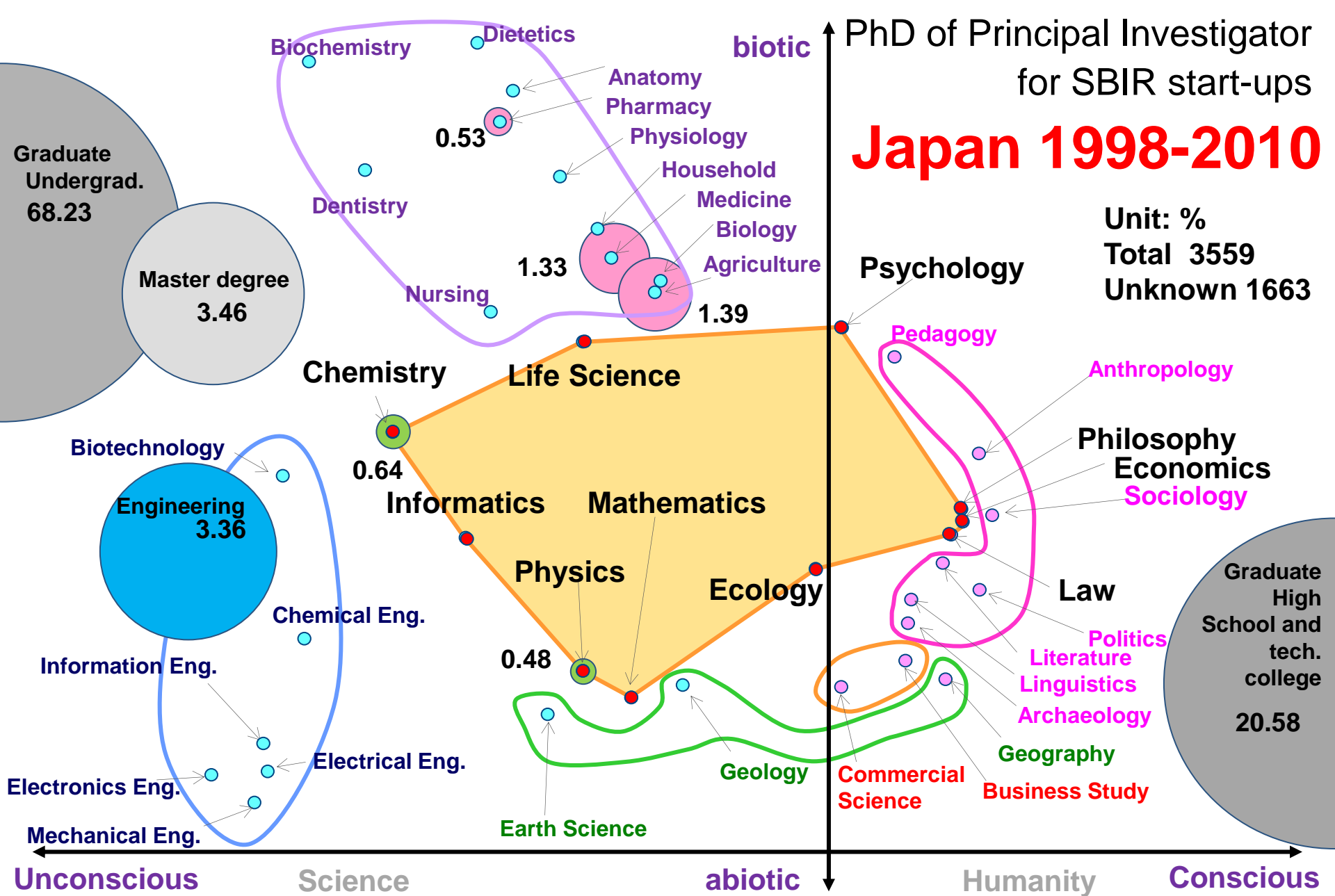


技術開発を支援する! SBIR [中小企業技術革新制度]

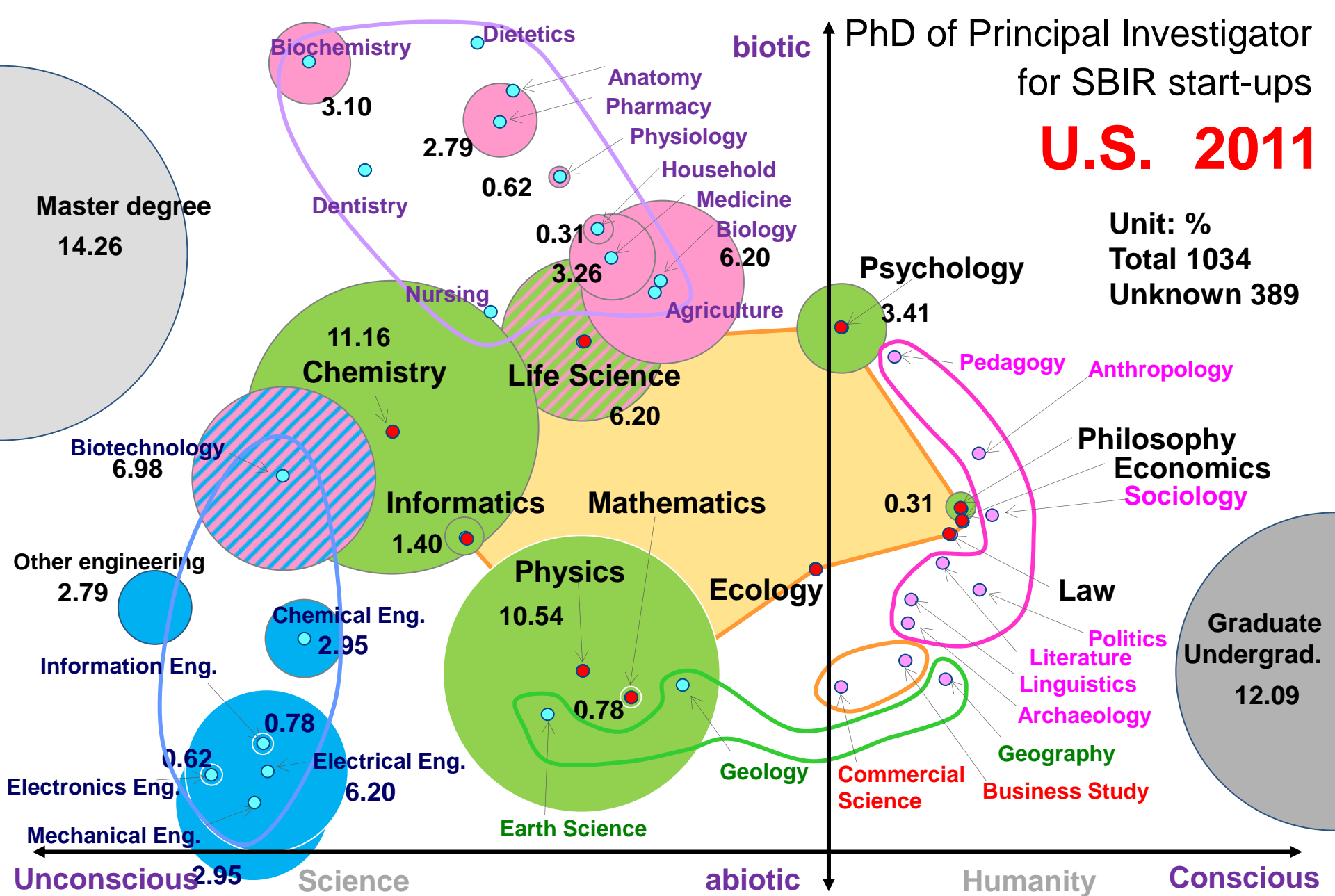
SBIRは、中小企業による研究技術開発や、開発成果の事業化を一貫して支援する制度です。



- Japan started its own SBIR program in 1999 inspired by the American SBIR
- It is not mandatory for ministries.
- It is just one of the subsidization programs for SME.



In Japan, leading-edge knowledge produced under the soil has no linkage to the innovation initiated by SBIR since 1999.



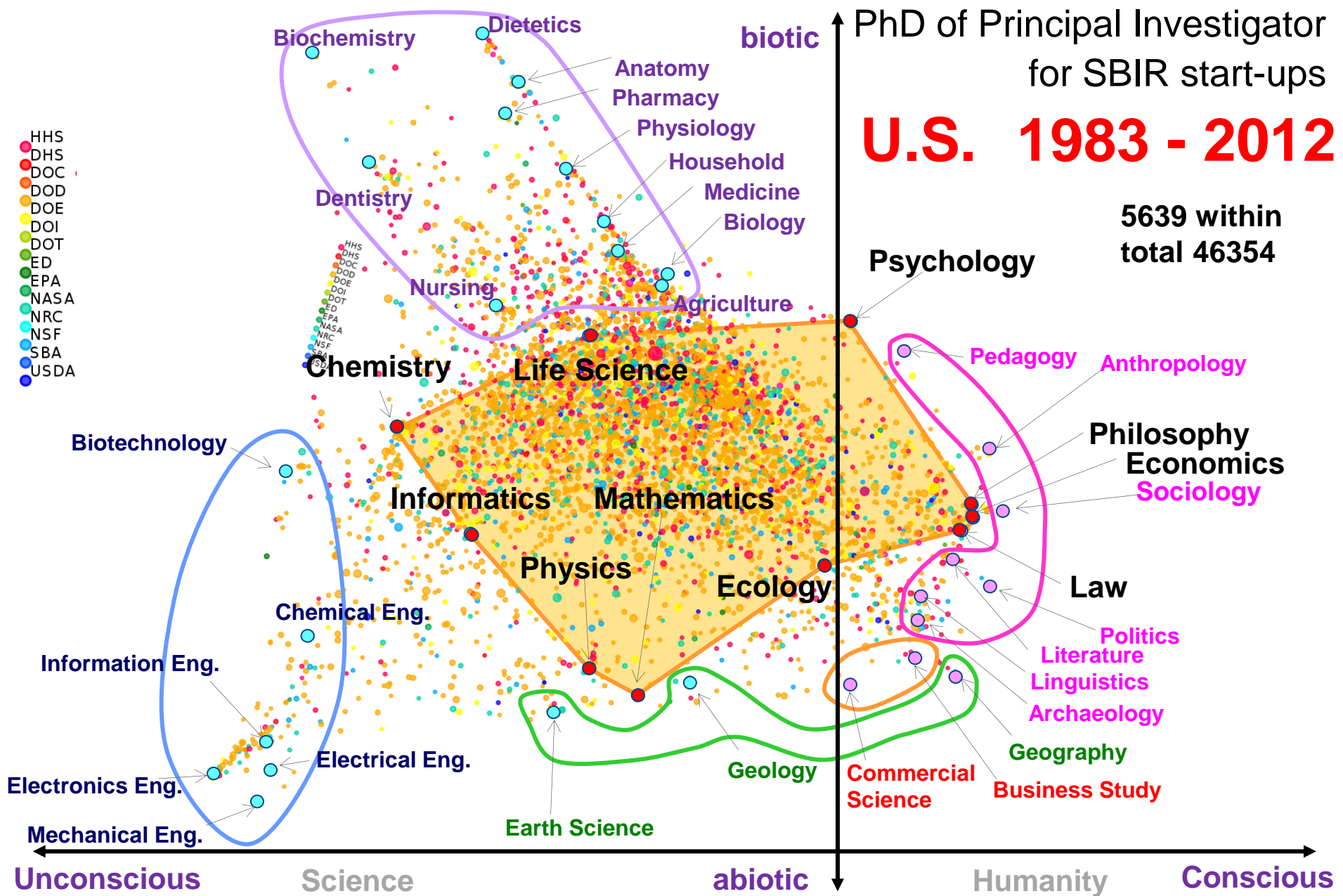
In U.S., leading-edge knowledge produced under the soil have been systematically converted to the innovation by SBIR since 1982.

PhD of Principal Investigator
for SBIR start-ups

U.S. 1983 - 2012

5639 within
total 46354

- HHS
- DHS
- DOC
- DOD
- DOE
- DOI
- DOT
- ED
- EPA
- NASA
- NRC
- NSF
- SBA
- USDA

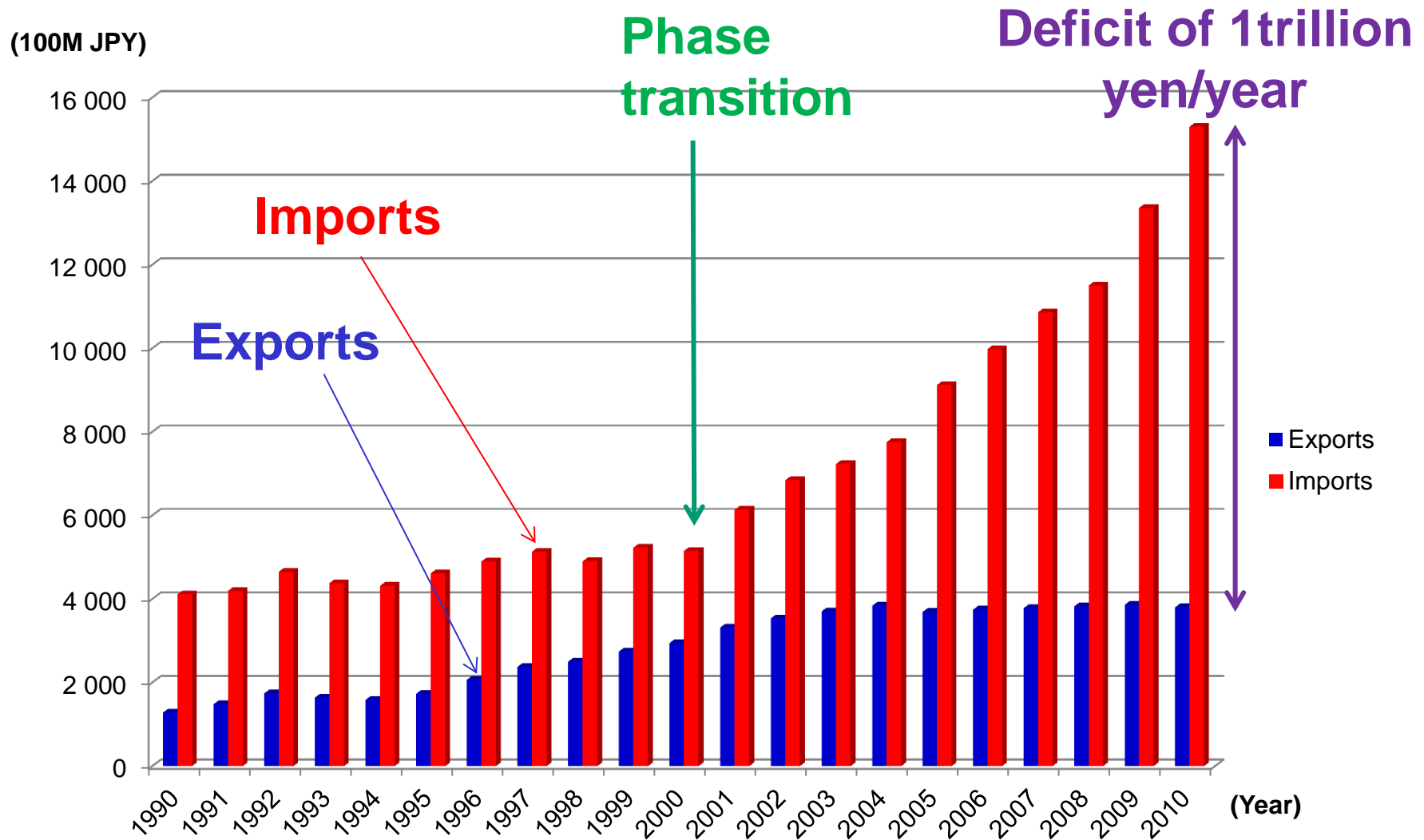


In U.S., most principal investigators put pivot legs on life sciences and other legs on core sciences since 1982.

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Drug export and import in Japan

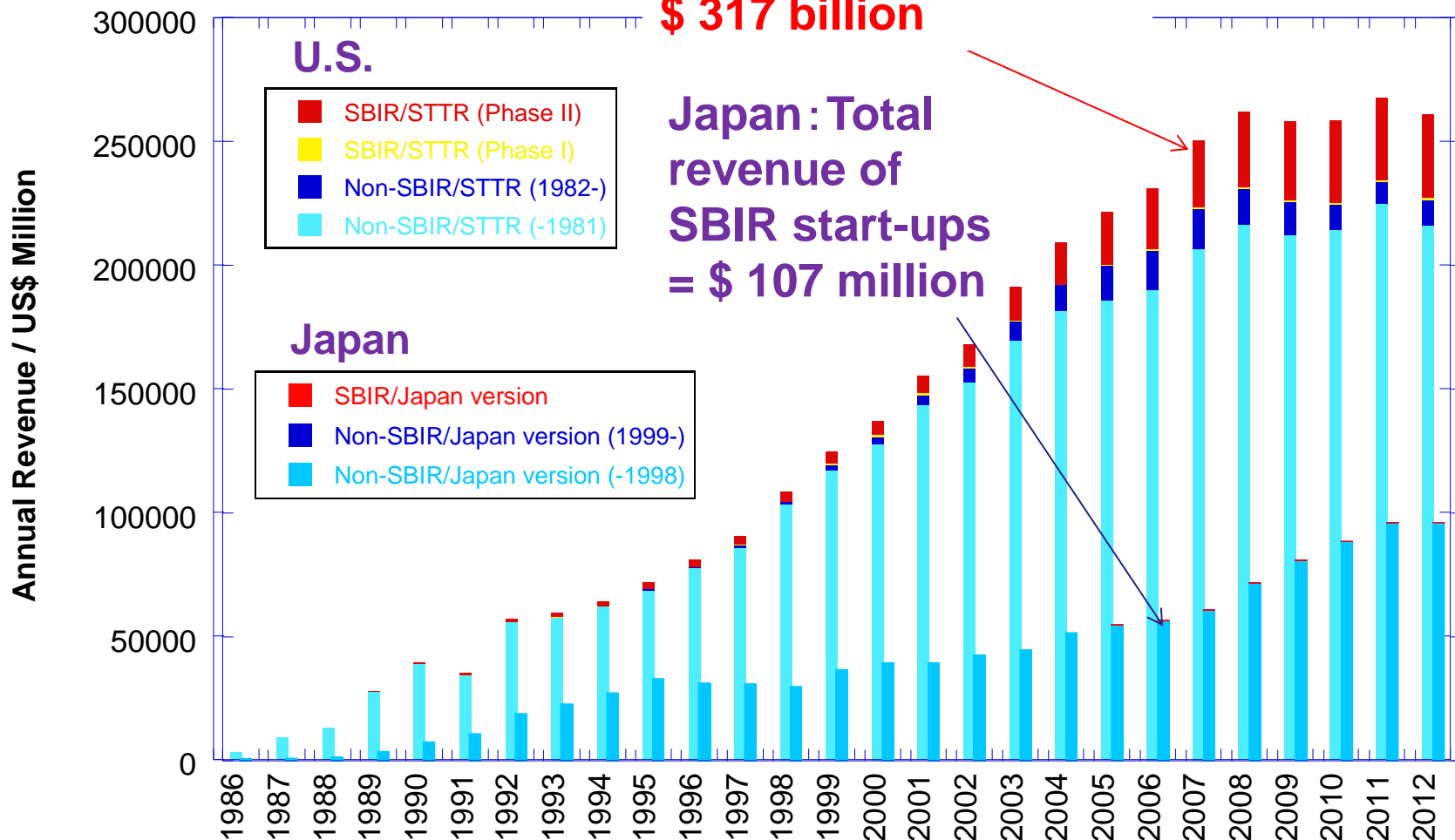


Source: JETRO, Trade statistics database

Prescription drugs sales: Revenue

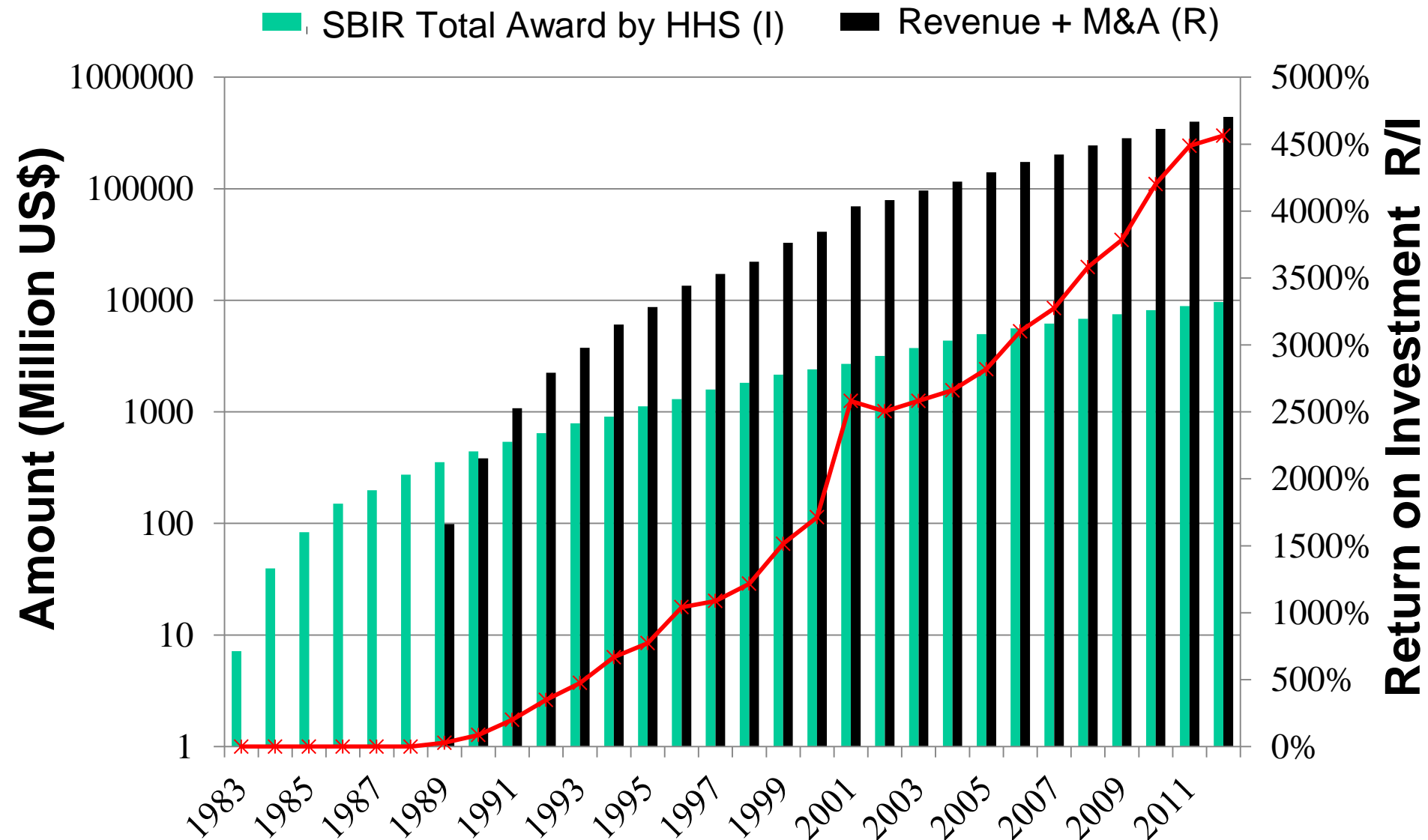
U.S.: Total revenue of SBIR start-ups = \$ 317 billion

Japan: Total revenue of SBIR start-ups = \$ 107 million



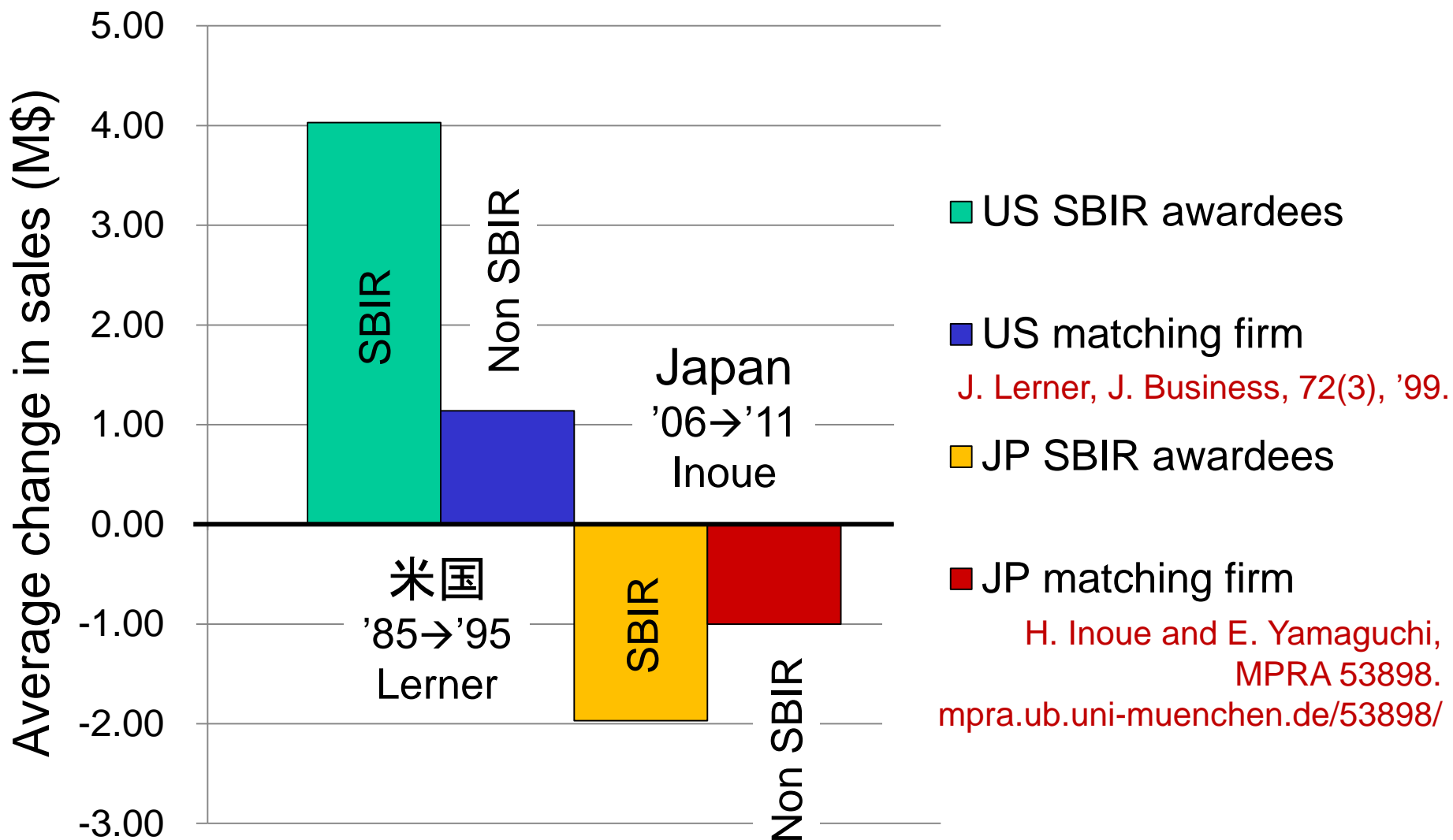
by S. Yamamoto and E. Yamaguchi

US SBIR: Return on Investment



by S. Yamamoto and E. Yamaguchi

Comparison in growth of SBIR awardees



We proved that the Japanese SBIR policy is a complete failure. It is necessary to reorganize the innovation policy in Japan from scratch.

Conclusion

1. To realize the 21st innovation model as I proposed, it is needed to encourage the “abduction and transilience” for innovators.
2. The U.S. has succeeded in making the innovation eco-systems consisting of “abduction and transilience” mechanism for innovators by enforcing SBIR since 1982. Especially, the SBIR has given rise to a remarkable effect on creating bio-medical industry in U.S.
3. On the other hand, Japan has failed to make the innovation eco-systems, although it has operated SBIR since 1999. This is because the Japanese SBIR has no thought at all to encourage the “abduction and transilience” for innovators.
4. Japan must encourage the scientists to be entrepreneurs by enforcing exactly the same SBIR as American one.