# STUNS life science
## UPPSALA BIO

**PROJECT:** INNOVATION STRATEGIES IN LIFE SCIENCES

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## Executive Summary

A successful innovation strategy is a key element in companies. To keep up with the rapid advancements in science and technology, companies need to use all their expertise; and many times, external aid, to stay competitive. Innovation can take place in product development and also in business development such as new profit models. This report aims to analyze how large life science companies stay innovative and what impact their innovations have in society. Through quantitative and qualitative research, selected companies will be analyzed to conclude on what are the best practices and main drawbacks when creating innovation strategies. A distinction between internal innovation and external is used to compare both innovation practices. Moreover, a critical analysis will also point out how companies' strategies affect society's access to innovation and what is the role of companies when creating value through innovation.

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# 1. Introduction

1.1. Defining innovation

Innovation is defined as "a new idea or method or the use of them" (1) and many companies wish to be innovative today. Examples of such are technological improvements, new drug developments or a new way of service providing. Yet one question many companies fail to reflect on is what is the purpose of being innovative. There is a trend that many companies claim to be "innovative" but just because a new technology provides an improvement it does not mean it will create **value**. Contrarily, invention means to "find out" or to "discover" (2). In a way, that is more accurately what most companies are accomplishing today. They are inventing new products but they are overlooking the importance of creating value.

For the purpose of this report, there will be a distinction between the definition of inventing versus innovating. Invention is defined as creating new or improving something. Innovation is creating new or improving something to fulfill the unmet needs in the market that ultimately will generate a larger value for society.

1.2. Innovation in life science

The life science industry is an interesting sector to investigate when it comes to invention and innovation. Life science companies (LSC) are responsible for developing treatments and diagnostic tools. They are shaping the future of healthcare and the role of innovation in LSC is crucial not only for the company's financial sustainability but also for the availability of products to society.

   *1.2.1. History: how it was in the past*

Looking at the innovation trends from the last 40 years for pharmaceutical and medical device companies; there has been a clear increase in Research & Development (R&D) investment (3). This can be observed in figure 1.

Nevertheless, the research productivity has decreased even though the money invested in developing new products has significantly increased, see figure 1. This correlation shows that innovation efficiency has decreased in the last years (4,5). This decrease can be caused by several factors:

- Change of direction for drug development; from small chemical molecules to more sophisticated biopharmaceuticals. R&D was getting more difficult in general, the most obvious ideas were being discovered first, so new ideas were harder to discover.
- Companies were not applying the correct innovation strategy. A closed-door innovation without collaboration makes idea generation very challenging.
- Strong regulatory, ethical and legal frameworks. Lack of R&D investment from the government. The external stakeholders were not ready to implement the innovations in the healthcare system.
- Long rate of return on investment and incremental innovation. Companies were not encouraging disruptive innovation due to the high risks and pressure of satisfying shareholders.
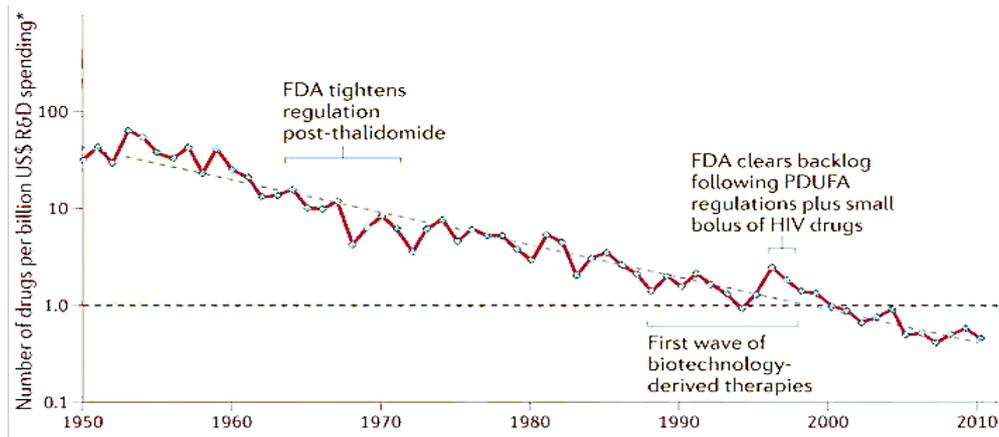
**Figure 1:** Eroom's law is the observation that drug discovery is becoming slower and more expensive over time, despite improvements in technology. (5)

### 1.2.2. Now and future: how is it now and how will it be in the future

The current trends that can be observed in LSC is that products have shorter life cycles, golden standards are changing faster than ever, and there are huge competition of innovations targeting the same patient groups. This is why acquisitions, collaborations and partnerships have grown to be even more popular for new ways of inventing and innovating (6). Instead of independently trying to create value for society, many large companies are partnering in their own therapeutic areas with smaller businesses where there is strong ideation and value creation internally, but they have difficulty commercializing the products. Other large companies are collaborating tighter with relevant stakeholders to be closer to its end-users and others focus mainly on acquiring successful value creating companies to be the owner of the products (7). The future will most likely be promoting even more "open innovation" strategies

### 1.3. Purpose of the project

With the definitions of invention versus innovation in mind and the new trends that have developed over the years of how companies are performing them, the project aims to develop an understanding of this landscape. It is known that most start-up companies are very agile and are excellent at innovating, but this project aims to discover how a large company can be agile and foster innovation.

### 1.4. Delimitations

Firstly, only large companies were selected as it is in line with the purpose of the project. Secondly, only pharmaceutical companies were selected due to the ease of data accessibility and interest. Nevertheless, quantitively measuring innovation has been challenging and therefore estimations were used (see Methodology section). Even though the strategic decisions taken now may have an impact twenty years later, the companies were studied for a fifteen-year period, due to the limited time available. Moreover, some of the companies have been very open with their innovation strategy while others have not; thus, a lack of qualitative data has been an impediment to do a thorough analysis on all of them.

## 2. Methodology

A workflow was created in the first week and followed accordingly throughout the project. Some adjustments were made along the way but the final workflow is visualized in Figure 2.

The definition of innovation was a crucial step for the project. Online research was performed by analyzing other innovation performance indexes. By having a clear definition, the analysis of how large LSC innovate was transparent with an unambiguous perspective. In order to select which LSC would be interesting to investigate, several aspects were considered. Firstly, the EU R&D Annual Scoreboard by the *EU commission* (3) and the Pharmaceutical Innovation Index by *IDEAPharma* (8) were considered. These specify which LSC invest most in R&D and how successful they are in market launches (3,8). Secondly, the companies with the most interesting fluctuations in the Scoreboard and the Index in the last 5 years were selected. Thirdly, the ease in performing qualitative interviews with relevant individuals from companies was considered. See table 1 for the complete selection of LSC.

**Table 1:** Companies selected for the study

| Type | Company | Headquarters | Focus Areas | | | |
|------|---------|-------------|-------------|---|---|---|
| Pharmaceuticals | **AstraZeneca (AZ)** | United Kingdom | Oncology, CVD | | Respiratory & Immunology | Renal metabolism |
| Pharmaceuticals | **Bayer** | Germany | Oncology CVD | | Hematology, Multiple sclerosis | Pulmonary hypertension Women Care |
| Pharmaceuticals | **Bristol Myers Squibb (BMS)** | United Kingdom | Oncology | CVD | Immunoscience | Fibrosis |
| Pharmaceuticals | **Incyte** | United States of America | Oncology | | Inflammation | Autoimmunity |
| Pharmaceuticals | **Janssen** (Johnson & Johnson) | United States of America | Oncology CVD Immunology | | Infectious Diseases & Vaccines | Pulmonary hypertension Neuroscience |
| Pharmaceuticals | **Roche** | Switzerland | Oncology CVD | Metabolism Immunology | Respiratory Hemophilia Neuroscience | Infectious Diseases |
| Pharmaceuticals | **Swedish Orphan Biovitrium (Sobi)** | Sweden | Hematology | | Immunology | |
| Pharmaceuticals | **Takeda** | Japan | Oncology Rare Diseases | Gastroenterology Neuroscience | | Plasma-Derived Therapies and Vaccines |

The investigation of the selected companies consisted of retrieving qualitative data (desktop research & interviews) and performing quantitative data analysis. The desktop research was examining the company's website and press releases. The interviewees were carefully selected with a strong preference in roles directly related to innovation and strategy. See appendix 1 for a list of the interviewees. The interview guides were based on a framework adapted from the *Global Innovation 1000 report* by Strategy& Pwc (9). The framework consisted of 6 topics that analyzes the successfulness of innovating and they were transformed into 5 for the interviews. These are: how well companies aligning innovation strategy with its business strategy, how well companies create cultures among employees to foster innovation, how much top-management is involved in innovation strategy, how innovation projects are selected and how and if innovation is based on end-users needs. For the quantitative data, the analysis consisted of identifying statistical and financial values that reveals the innovation strategy efficiency of the companies. It is important have an objective comparing unit between the companies where the selected values were used relevantly.

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The two data sets were compared to distinguish the companies from another. Additionally, other organizations such as innovation centers and consulting companies have also been investigated to add a different perspective and layer to the analysis of innovation strategies in LSC. These organizations can be seen below in table 2.

**Table 2:** Selected organizations for the study

| Type | Name | Headquarters | Basic info |
|------|------|--------------|------------|
| Medical Device | **Philips Healthcare** | The Netherlands | Medical device company with a relevant Innovation hub |
| Organization | **Testa Center (Cytiva)** | Sweden | Innovation center from a public-private partnership, owned by biotechnological company Cytiva |
| Consulting Company | **IDEA Pharma** | United Kingdom | Consultancy company specialized in innovation strategies in Pharmaceutical companies |

The last part of the project was to analyze the comparisons and ultimately link it back to the purpose of the project which was to answer how LSC have different innovation strategies and make a conclusion on which are the most successful.
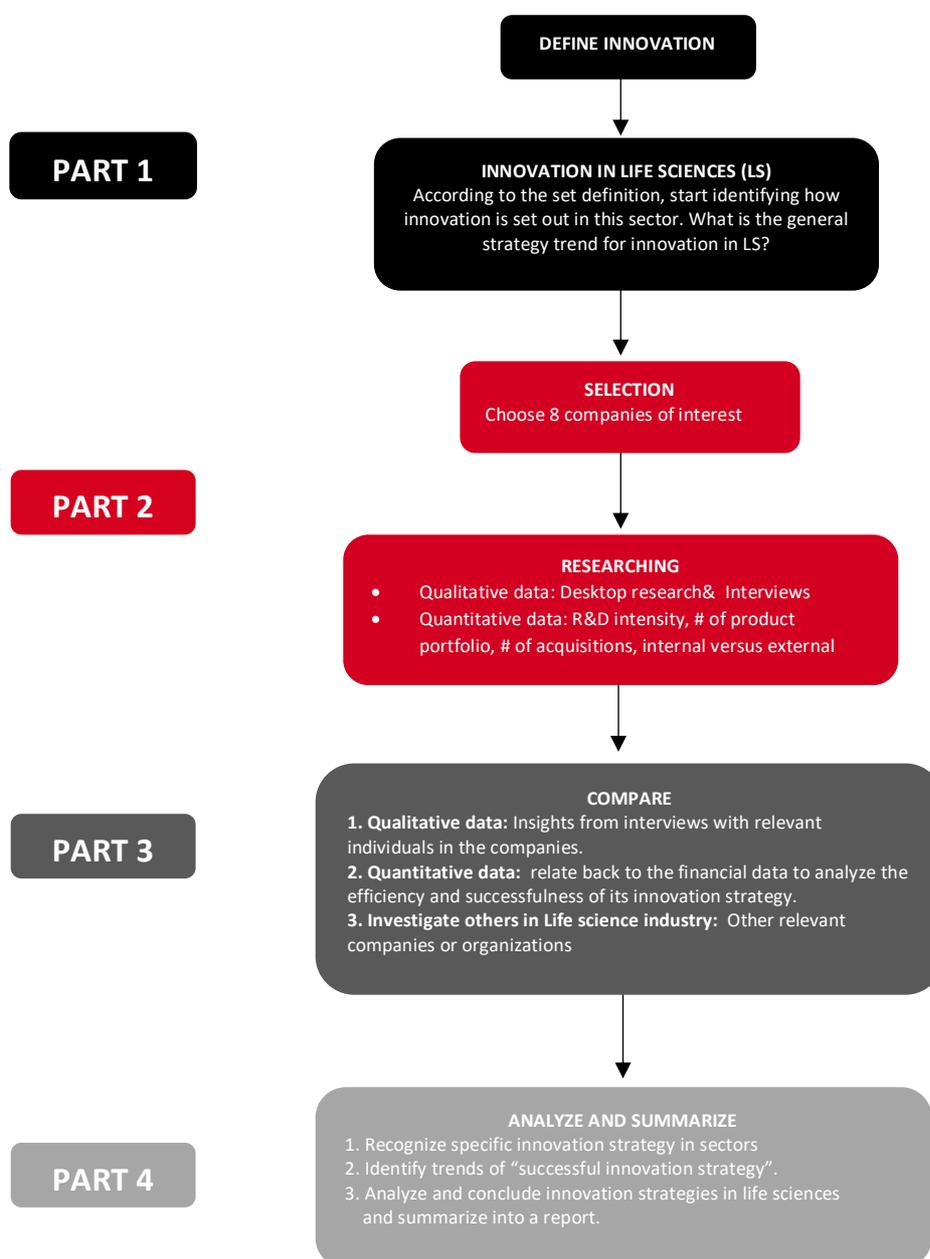


DEFINE INNOVATION

**PART 1**

INNOVATION IN LIFE SCIENCES (LS)
According to the set definition, start identifying how innovation is set out in this sector. What is the general strategy trend for innovation in LS?

SELECTION
Choose 8 companies of interest

**PART 2**

RESEARCHING
- Qualitative data: Desktop research&  Interviews
- Quantitative data: R&D intensity, # of product portfolio, # of acquisitions, internal versus external

COMPARE
**1. Qualitative data:** Insights from interviews with relevant individuals in the companies.
**2. Quantitative data:** relate back to the financial data to analyze the efficiency and successfulness of its innovation strategy.
**3. Investigate others in Life science industry:** Other relevant companies or organizations

**PART 3**

ANALYZE AND SUMMARIZE
1. Recognize specific innovation strategy in sectors
2. Identify trends of "successful innovation strategy".
3. Analyze and conclude innovation strategies in life sciences and summarize into a report.

**PART 4**

**Figure 2:** Workflow of project

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# 3. Results

Most of the companies have similar ways of performing project selection and aligning their innovation strategy with its business strategy. All the company's innovation strategies include basing innovation on end-users needs, creating culture among employees to foster innovation and involve top management frequently. This creates synergy for an innovative environment to generate ideas, identify trends and needs in the market and promote open innovation through collaborations. These different strategies can be summarized into either internal versus external innovation. Internal relates to activities that are being performed in-house, while external innovation is the opposite. A usual approach for external innovation strategy is partnerships or acquisitions to expand the company's product portfolio. As the advances in drugs have been speeding up cost of developing drugs has been increasing substantially, collaborating with external partners is becoming more common to stay competitive.

3.1. Internal innovation

### 3.1.1. R&D investment & intensity

The traditional approach of companies performing innovation is within closed doors; internal R&D to maintain secrecy and competitivity and most companies have excellent R&D divisions. Having such teams and their facilities is a significant expense that can require around +/- 20% of the company's revenue. R&D investment has been increasing over the last 2 decades for all of the companies as seen in figure 3a. Yet the proportion of revenue invested in R&D, R&D intensity, has been different. This indicates how much a company focuses on internal R&D. BMS and AZ have had a clear increase in R&D intensity whereas, Takeda, Janssen and Bayer do not show an increasing trend (see figure 3b).
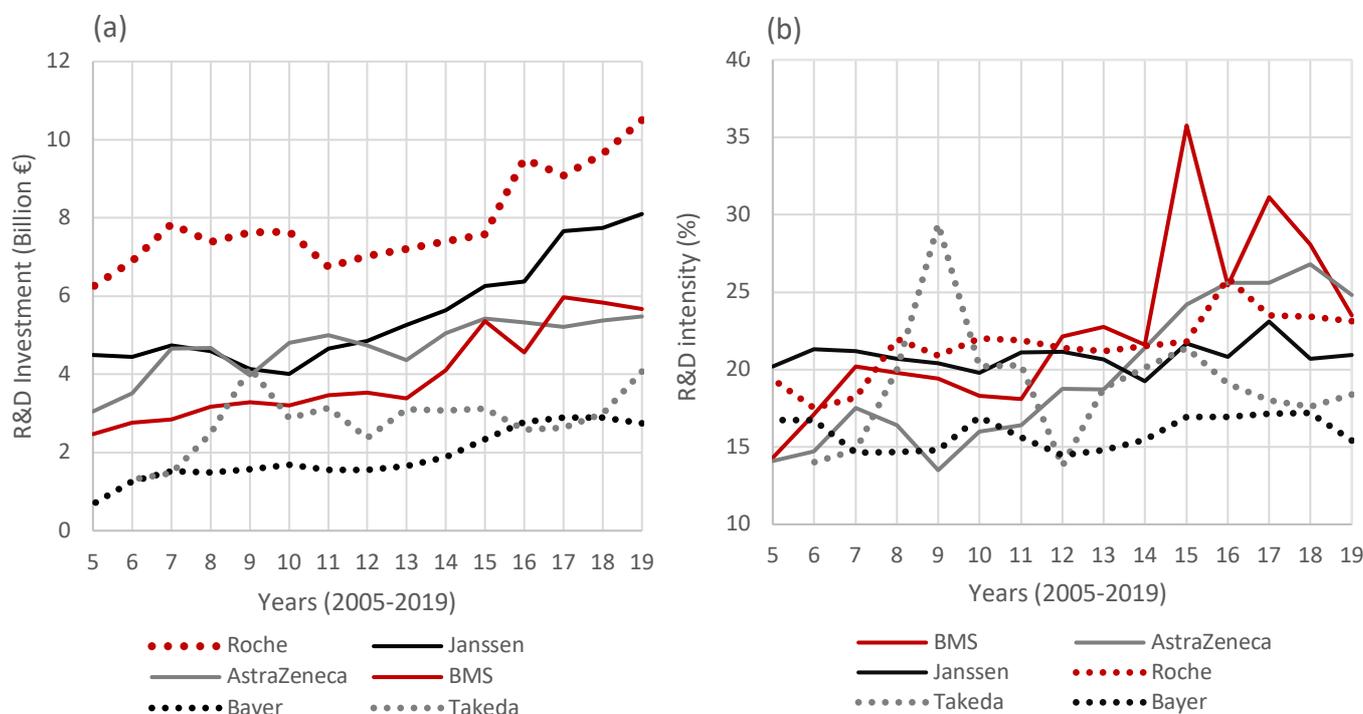


**Figure 3:** (a) R&D investment by company and (b) R&D intensity by company from 2005-2019. Roche spends the most in R&D yet AZ has the most relevant R&D Intensity increase (2019) (33–40).

### *3.1.2. Product pipeline developed in-house*

Drug development is a long process of approximately 10-15 years and one can see the outcome of its R&D investment only years later. By looking at the development project pipeline of the companies, one can identify which companies have the most internally developed projects. That may distinguish between companies which have other strategies in developing projects external innovation). Figure 4 below indicates the percentage of how many projects have been developed internally over the last 5 years. For most companies, the percentage is decreasing, which follows the trend of companies increasing their external innovations. Interestingly, Sobi and Incyte has the highest percentage of projects developed in-house and they are also the smallest companies in this group (number of employers). Sobi is however gradually entering many collaborations with extensive product launch experience and expertise which could explain the decreasing trend in the last years.
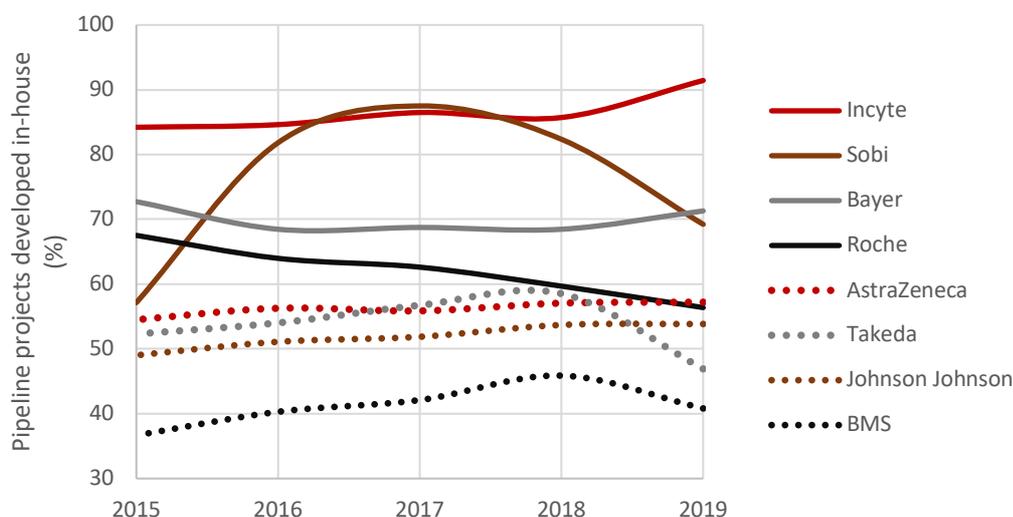


**Figure 4:** Percentage of pipeline projects developed in-house by company over the last 5 years. The 5 years is the timespan where one can see the outcome made back in 2000 and onwards (10–14).

### *3.1.3. Fostering innovation among internal employees*

Companies need to use the full capability of its R&D divisions to perform innovative drug developments. Their goal is to resemble the ideation environment of a start-up atmosphere; but being a global company with thousands of employees and many layers of management makes it a difficult task. Majority of the companies have initiatives that aims to gather all kinds of ideas from its employees (Interviews). In some companies, it lasts a week in a form of an ideation competition while others have one-day events frequently (interviews). Some companies have an internal database accessible where anyone globally can upload their ideas and exchange feedback with others (Interviews). Google allows employees to spend 20% of working hours on any project of their own that can benefit the company (15,16). The reasoning lies within that many senior employees can produce great ideas, especially with their experience but they neither find the time or the courage to do so. AZ R&D 5R's framework (17) is based on increasing internal R&D efficiency. The framework is based on giving incentives for decreasing project development pipelines and valuing failures. Projects being cancelled at an earlier stage has been the key to success for AZ. The result has been that they have increased the projects from candidate to Phase III from 4% to 19% (17,18). Such programs aim to foster innovation from within and it must allow employers to both manage its daily operations and simultaneously develop their promising projects (Interviews).

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3.2. External innovation

### 3.2.1. Acquisitions

There are many drivers that govern why a pharmaceutical company wants to invest in acquisitions of companies; high R&D costs, economies of scale, expanding into a new market or keeping up with competition. But it takes effort to incorporate all the acquired assets; especially when larger companies are being acquired (7). Roche the highest number of acquisitions as one can see in figure 5. One well-known example of Roche's most successful acquisitions is Genentech back in 2009 where three of its successful products has been launched from that subsidiary over the last 5 years (19–22). AZ acquired the entire diabetes unit from BMS as their strategy was to expand themselves in the Diabetes area (23). BMS acquired the hugely successful Celgene in 2019, which became the third most expensive acquisition ever in the pharmaceutical industry since 1999 (24). It bumped BMS up to being 2nd in the Pharma Innovation Index (8). Takeda also recently acquired Shire in 2019 which expanded their global biopharmaceutical capabilities (25). Incyte and Sobi are quite young companies (1991 and 2001) and therefore makes sense to have the smallest amount of acquisitions. With that said, Bayer is one of the oldest companies (1863) but have not invested as much in acquisitions like Janssen and Roche.
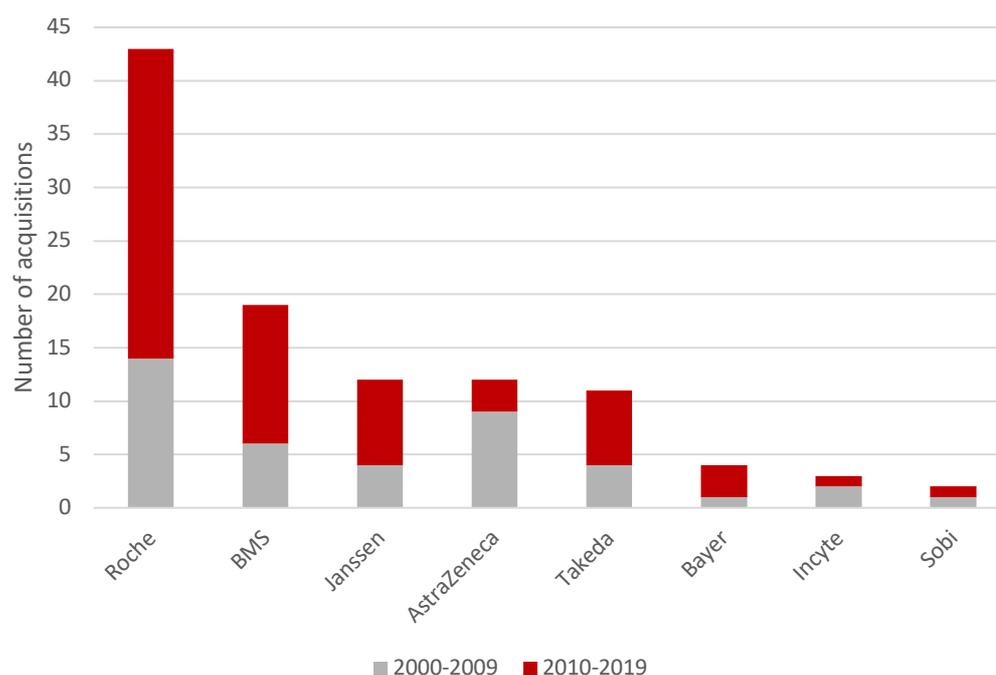


**Figure 5:** Number of acquisitions by company. (19,26–32) in the last 20 years.

Figure 6 below is comparing the acquisition expenditure versus the R&D investment. This makes it possible to see how much companies are investing in in-house developments (internal innovation) or purchasing ideas (external innovation). BMS is among the highest for its Celgene acquisition. Even though Roche has the highest number of acquisitions, they acquire companies for low prices and therefore are far on the bottom of the graph. Interestingly, they have among the highest R&D investments as well but it clearly indicates that there is an inefficiency of making drugs in-house since other companies with lower R&D budget have had a similar number or market authorizations in the last 5 years.
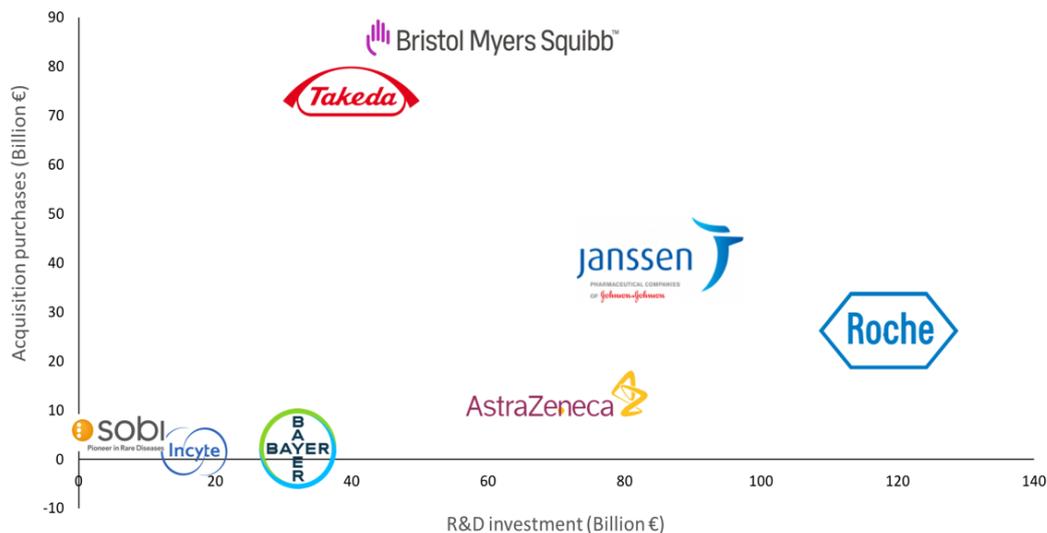
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**Figure 6:** Company distribution by R&D investment and Acquisition expenditures. Values have been added and are total of the 2005-2019 period. (19, 26-40).

### 3.2.2. Partnerships and collaborations

An important aspect of a successful business is being able to grow and collaborate with others. Companies can identify what their business is lacking and complement that with another company's skills without the need to acquire each other. It is usually due to expiring patents and a tight regulatory environment where companies are even partnering with their own competitors today (41). Figure 7 indicates the number of product launches resulting from collaborations over the last 5 years. They have been classified as internal, internal from a subsidiary, result of a collaboration or resulting from an acquisition. Acquisitions relates to product launches before acquisition date whereas subsidiaries are product launches after acquisition date. The usual trend has been that LSC identify small biopharmaceutical companies with a specific focus area that they are trying to expand in e.g. oncology or immunology. These companies usually lack the financial stability to continue the drug development into the next clinical trials phase or commercializing the products and that is where these large companies have competence in.
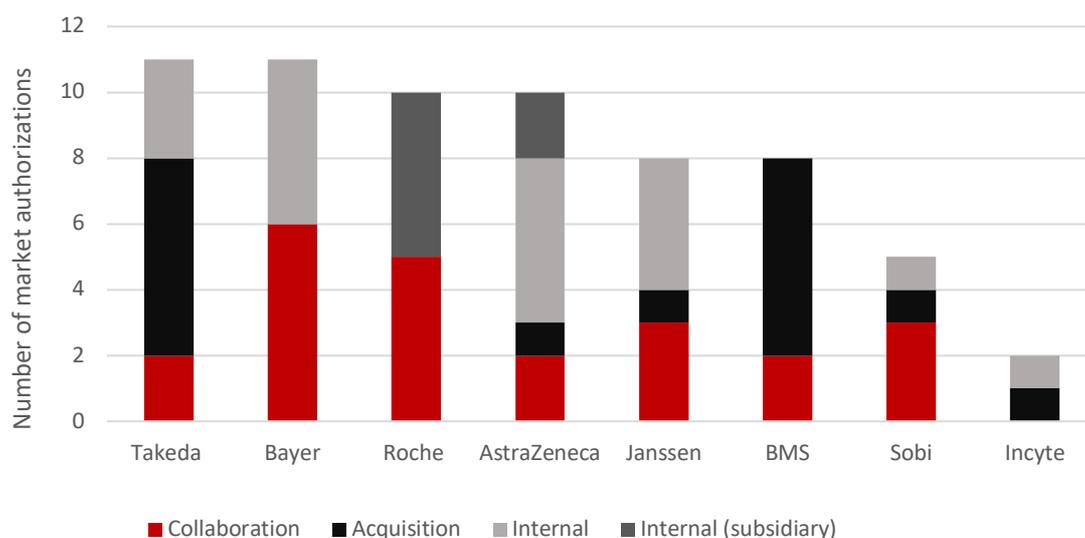


**Figure 7**: Novel drugs launched by company between 2015-2020 (20–22,42–70). The products are active substances with a market authorization by the EMA centralized procedure and the number of new molecular entities or new biologicals approved by the FDA (71,72).

Majority of the companies have innovation hubs purely for the purpose of creating potential collaborations and partnerships. This is usually how the companies of interest are identified and analyzed. Some examples are company owned innovation centers providing support for companies for their product development and prototyping (Interviews). These focus in value creation for the companies, but their objective is capturing value themselves. They aim is to extract the promising projects derived from their innovation center and integrate them into the company. Other types of innovation centers are partially funded by the local government as well (Interviews). These centers are open to any ideas and is not required to be aligned with the company's own business and focus areas. Innovators pay a fee, but they have full rights (intellectual properties, financial) to their own products and potential findings resulting from using the services from the innovation center. The aim of these centers from those companies is to organically create collaborations and partnerships. It is not a requirement from the companies to initiate anything with the innovation centers.

3.3. Summarizing Results

Table 3 and figure 8 aims to summarize most of the aspects analyzed for each company in terms of how innovation is perceived, planned and performed. Firstly, the columns internal projects number and collaboration reveal how internal or external the company's innovation strategy is. With regards to performance of internal innovation, the internal efficiency column provides information on how successful the company is in leading new drug launches by considering its R&D investments. The acquisition number and investment columns reveal how much the companies performs external innovation by number of company acquisition and how large the expenditure was for them. Lastly, to have a sense of how much companies are willing to create value through innovation, the highest score (number 3) reveals how much the company executes.

**Table 3:** Summary of results. The scores 0-3 have been based on the company's achievements in the last 5 years. See Appendix 3 for estimate justifications.

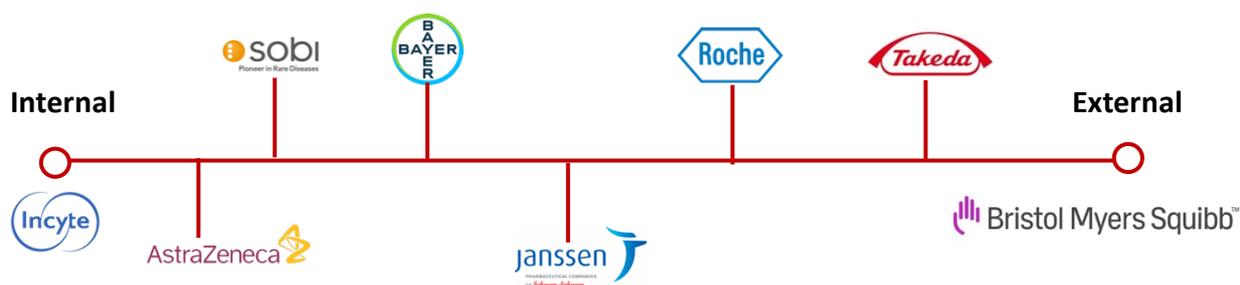| Company | Internal projects number | Internal efficiency | Collaboration | Acquisition number | Acquisition investment | Value creating initiatives |
|---|---|---|---|---|---|---|
| AstraZeneca | 1 | 3 | 1 | 1 | 1 | 1 |
| Bayer | 2 | 3 | 3 | 0 | 0 | 3 |
| BMS | 0 | 0 | 1 | 2 | 3 | 1 |
| Incyte | 3 | 1 | 0 | 0 | 0 | 0 |
| Janssen | 1 | 2 | 2 | 1 | 2 | 3 |
| Roche | 2 | 2 | 3 | 3 | 2 | 0 |
| Sobi | 3 | 3 | 3 | 0 | 0 | 0 |
| Takeda | 1 | 2 | 0 | 1 | 3 | 1 |



**Figure 8:** Classification of internal versus external innovation strategy of the companies.

## 4. Conclusion

The companies can either be classified as using external forces to foster innovation or internal forces. But what are the challenges of the two and how well are they really fostering innovation? How good are they at bringing value to society? There are strong and weak aspects for both innovation strategies, and it is interesting to identify which of them are efficient in fostering innovation.

Starting with internal innovation, it is important to question if investing and creating a culture among employers to ideate produces value for the company or if it is just to engage the employers. Short and inconsistent ideation competitions will not result in scalable projects if there is not the right implemented process to do so. Fostering internal innovation should start with top management involvement, to generate a company-wide culture that awards ideation and discussion among employees. Specially in the case of global companies, this effort should be performed globally to consider the needs in each geographical region. Generating synergies among different departments internally will create a better environment than creating competition among its internal employees.

As for external innovation, many of the recently developed drugs are a result of these collaborations. The strong regulatory, ethical and market access requirements in the life sciences industry is leaving small companies to only be able to partner with a large company, which might or might not bring to the market its most innovative projects. The small companies would be required to comprise towards the larger companies which could prevent them from growing into their full potential.

With regards to acquisitions, when large companies acquire smaller innovative companies; the innovation potential from smaller companies might be hindered by the large companies' business strategy. The fact that mostly only large corporations can bring products to market, is a negative aspect in the life science's industry innovation. It raises a question if this is really a good development of having large companies always taking the small ones.

The strategy in choosing the right projects to develop is a challenge for both internal and external innovation strategy. Prioritizing projects will be a crucial step to bring the right value to society. If companies innovate in the similar focus areas such as oncology due to high technological advances, value will not be distributed equally.
After choosing and developing the innovative projects, implementing them is a crucial part of the innovation strategy. Having external forces in mind (stakeholders, laws, cultural aspects, environmental aspects) will help companies engage better with relevant authorities on a local and global level to find the best way to solve their needs. Having said that, without the right external environment, a company will struggle to keep innovative. A lack of public R&D funding, high quality education, research centers or infrastructure will make it harder to get and develop good ideas; thus, a good innovation strategy from the local governments will be crucial to create value through innovation.

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# 6. Appendix

6.1. Appendix 1 – Interviewee list

| Company/Organisation | Name | Role/Position |
|---|---|---|
| Bayer | **Tomer Feffer** | Head of Pharmaceutical Division Scandinavia Bayer |
| IDEA Pharma | **Mike Rea** | CEO |
| Janssen (Johnson & Johnson) | **Anna Käll** | Head of Public Affairs, Johnson & Johnson Sweden |
| Philips Healthcare | **Bas Klaver** | Head of Philips Innovation Services |
| Roche | **Per Brinck** | Head of Business Development |
| Sobi | **Patrick Strömberg** | Director Corporate Development and Product portfolio Management |
| Takeda | **Sanna Venetvaara** | Head of Center of Excellence Innovation Center Nordics |
| Testa Center (Cytiva) | **Jesper Hedberg** | Managing Director |

6.2. Appendix 2 -  Interview guides

Interview guides have been designed considering each interviewee's experience and professional role. They have been adapted from an interview guide base that aims to investigate several topics of each company's innovation strategy. The following is an example of the interview guide base, to be adapted for each role:

Topic 1: They closely align innovation strategy with business strategy
**Question 2:** What do you understand as innovation within pharmaceuticals? How do you translate to your business strategies?
**Question 3:** Why do you have your offices next to a research centre or university?

Topic 2: They create company-wide cultural support for innovation
**Question 1:** How much are your employees' part of the innovation strategies?
**Question 2:** How is the relationship between the different company divisions globally? Do you share information and insights on a regular basis?

Topic 3: Their top leadership is highly involved with the innovation program.
**Question 1:** How is the relationship between your division and its headquarters?
**Follow-up question:** When planning the strategy for Scandinavian regions, do you see any difference compared to the strategies developed by the headquarters?
Example are:
1. Acquisitions (information from local offices on promising companies)
2. Business development strategies (how to innovate your strategy locally)

Topic 4: They base innovation on direct insights from end-users.
**Question 1**: Top innovative companies' base innovation on direct insights from end-users.
How do you think your company takes end-user insights into account?
**Follow up question**: Is your main strategy to look for the specific needs in the market and
deliver a specific solution? How do you plan your innovation strategy in accordance to that?

Topic 5. They rigorously control project selection early in the innovation process.
**Question 1**: How do you perform a selection process for an innovative idea?
**Question 2**: What is the main cause of project failure in your company? At what stage do you
normally have to cancel a project? Do you have any example?
**Final question:** Would you say your company is an innovative company? Why?

6.3. Appendix 3 – Table 3 estimations

The following estimations have been done to calculate each score for the respective category:

- **Internal projects number:** The data used to generate figure 2 has also been used to
  generate estimations (10–14). The guidelines have been followed:
  - 0 = Below 40% of projects developed in-house
  - 1 = Between 40% and 60%
  - 2 = Between 60% and 70% with a decreasing tendency
  - 3 = Above 70% or ever reached 100% in the last 5 years

- **Internal efficiency:** To detect internal efficiency the following formula has been used
  as an estimation of how well the company performs internally led R&D:

$$\frac{\text{Market authorizations for internally developed medicines } 2015 - 2019}{\text{R\&D Investment } 2005 - 2019}$$

  - 0 = no market authorizations or ratio = 0
  - 1 = Ratio between 0 and 0.05
  - 2 = Ratio between 0.05 and 0.1
  - 3 = Ratio above 0.1

- **Collaborations:** The number of market authorizations for medicines developed
  mainly in collaboration with other organizations has been used. A percentage of the
  collaboration market authorizations between 2015 and 2019 has been used (See figure
  7).
  - 0 = No collaborations
  - 1 = Between 0 and 20% of market authorizations
  - 2 = Between 30% and 50% of market authorizations
  - 3 = Above 50% of market authorizations

- **Acquisition number:** The companies have been ranked regarding the number of companies they acquired between 2000 and 2019:
  - 0 = Less than 5
  - 1 = Between 5 and 15
  - 2 = Between 15 and 30
  - 3 = Above 30

- **Acquisition value:** The estimation for the acquisition value has taken the money spent on acquisitions between 2005 and 2019 (Acquisition expenditure, see figure 6). The higher the amount, the higher the value has been given. The following guides have been assigned:
  - 0 = Below 10 Bn €
  - 1 = Between 10 and 20 Bn €
  - 2 = Between 20 and 40 Bn €
  - 3 = Above 40 Bn €

- **Value creating initiatives:** To measure how much a company is willing to invest in value creation in their effort to collaborate with external organizations, the following guides have been used in the scoring:
  - 0 = No promotion of innovation hubs or idea accelerators open to external innovators
  - 1 = Value capturing initiatives. The innovation hubs funded by the company look for specific ideas in a narrow range of business areas; usually in line with the business strategy of the company or its focus areas. The main goal is to generate a partnership with a small/start up company in need of resources to develop an innovative idea
  - 2 = Value capturing initiatives similar to score 1 but the company has several locations around the world; trying to get ideas from different regions. The investment in these hubs is larger and there is more importance given to them.
  - 3 = Value creating initiatives. The innovation hubs funded by the company have programs to explore ideas and solutions that tackle global issues that do not need to completely aligned with the company's business strategy. Google X or Leaps by Bayer are an example of these hubs (73,74). The goal of these hubs is for the company to be exposed to innovative ideas, without having such a strong attachment to the business strategy.