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EXECUTIVE SUMMARY

GOVERNMENT ENCOURAGEMENT FOR MULTINATIONAL INVESTMENT IN LIFE SCIENCES

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KORET FOUNDATION | MILKEN INSTITUTE

About the Koret-Milken Institute Fellows Program

The Koret-Milken Institute Fellows Program accelerates Israel's economic growth through innovative, market-based solutions for long-term economic, social, and environmental issues. The program focuses on connecting government, philanthropic, and business resources that are vital to national growth and development.

Directed by the Milken Institute Israel Center, the Koret-Milken Institute Fellows Program awards annual fellowships to outstanding graduates of Israeli and international institutes of higher education. Fellows serve yearlong internships at the center of the nation's decision-making—the Knesset, government ministries, and other Israeli agencies—and aid policymakers by researching and developing solutions for various economic and social challenges.

In addition, fellows craft their own policy studies aimed at identifying barriers to economic and employment growth in Israel. The fellows' studies, carried out under the guidance of an experienced academic and professional staff, support legislators and regulators who shape the economic reality in Israel. The program offers the ultimate educational exercise, combining real-life work experience with applied research five days a week.

Throughout the year, fellows receive intensive training in economic policy, government processes, and research methods. They acquire tools for writing memorandums, presentations, and policy papers, and they develop management, marketing, and communication skills. The fellows participate in a weekly workshop, where they meet senior economic and government professionals, business leaders, and top academics from Israel and abroad. They also participate in an accredited MBA course that awards three graduate-level academic credits that are transferable to other universities in Israel. The course, which focuses on financial and economic innovations, is taught at the Hebrew University of Jerusalem's School of Business Administration by Professor Glenn Yago, Director of the Milken Institute Israel Center and Director of Capital Studies at the Milken Institute in California.

Fellows Program alumni can be found in senior positions in the public and private sectors. Some serve as advisers to government ministries while others work at private-sector companies or go on to advanced studies at leading universities in Israel, the United States, and Great Britain. Within the program's framework, more than 80 research papers have been published, catalyzing reforms, reducing barriers, bringing about economic growth, and improving the quality of life for Israeli citizens.

The Koret-Milken Institute Fellows Program is nonpolitical and nonpartisan. It is funded by the Koret Foundation, the Milken Institute, and other leading philanthropic organizations and individuals in the United States and Israel.

More about the program: www.kmifellows.org
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Executive Summary

Israel's competitive advantages in the life-sciences industry are evident in its leading academia, world-class researchers, and strong entrepreneurial culture that contributes about 50 new companies annually to an existing base of 1,000 businesses (ILSI 2010, IVC). The industry's potential is enormous and can build upon the worldwide successes of medicines based on Israeli academic research, the most prominent of which is Teva's multiple sclerosis drug Copaxone which had 2011 sales of $3.5 billion. (Merck, 2010; Outsourcinf-Pharma, 2011; Lighthouse Group, 2012).

Despite impressive achievements, the life sciences field is relatively young in the Israeli high-tech landscape. Accordingly, the business environment is characterized by a proliferation of smaller, younger companies with few larger or multinational companies (ILSI, 2010). Eighty-five percent of Israel's life-sciences companies have fewer than 25 employees, while 40% of the companies are less than eight years old.

The lagging development can be attributed largely to a shortage of investments due to the relatively large risk involved. Innovation in the life-sciences field requires a unique, occasionally expensive infrastructure, and the time required until first profits are realized is relatively long. Given the industry's potential and the market's failure to fund the sector sufficiently, the Israeli government supports the industry with various programs and incentives. Israeli companies that conduct research & development (R&D) activities are supported by the Office of the Chief Scientist (OCS) at the Ministry of Industry, Trade and Labor, which promotes programs aimed at reducing the development risk of new technologies and fulfilling the industry's growth potential.

Foreign direct investment (FDI), especially from multinationals (MNCs), is one of the most important channels that assist development of an industry. In addition to their huge investments, their international expertise is very meaningful to the local country. In the life-sciences field, MNCs have wide experience in the development process of biomedical products, working with regulatory agencies, state of the art infrastructures, capacity for large-scale production while meeting necessary standards, and global marketing and customer relationships. Most developed countries are aware of these advantages and make intense efforts to increase their attractiveness to MNCs.

Innovation and leading academic research are competitive advantages Israel has in the field of life sciences. Innovation is essential to MNCs' activities to ensure their prospective profits and financial growth. MNCs conduct research and development (R&D) activity in Israel, but the scale is modest compared to the potential. While cooperation agreements have been signed between MNCs and academia and between MNCs and several Israeli companies, a significant part of MNC activity in Israel is accomplished through mergers and acquisitions (Breski et al., 2011) which extracts intellectual property from Israel and displaces economic development.. MNCs have just 10 life sciences R&D centers in Israel and they are relatively small with about 380 workers, representing just 2.5% of the total R&D employment of MNC centers. By comparison, there are 25 multinational R&D centers in

the electronic-components field, which employ about 9,500 workers. How can Israel become more attractive as a center for MNC R&D in the life sciences?

Despite the important contributions MNCs make to the local economy, their interests are not always in line with local interests. This tension is especially evident when MNCs acquire the intellectual property (IP) of innovative local technologies and develop them in centers outside the country. In such cases, Israel is not rewarded with the taxes received from the sale of products based on the IP. This is especially common in the life-sciences field and particularly in the medical-devices industry. From 1996 to 2010, about 32 medical-device companies were acquired by MNCs for a total of $3.5 billion dollars (Breski, Gilman, & Koop, 2011). The economic impact these sales have on the entire life-sciences industry is enormous in forgone business development and job creation.

Developing the IP outside of Israel decreases the growth of demand in the value chain of life-sciences products, thus minimizing the potential growth of the entire industry. Although the government gets taxes from the IP sales, the amounts are small when compared to the enormous economic gains that could have been achieved had larger Israeli companies been built based on the IP. This is not to say MNC activity is not worthwhile in the field of life science. Rather, when encouraging MNCs to conduct activities in Israel, there should be conditions that make it worthwhile for the MNCs to conduct the IP development through local companies and joint ventures.

This report suggests a financial model that will serve as a framework to coordinate the needs and interests of the Israeli government, the MNCs, and the life-sciences industry. The model takes into account the unique conditions required for projects in life sciences (long development duration and guaranteed budget for this period), and the current trend among life-sciences MNCs to reduce their internal R&D activities at R&D centers. Accordingly, the model is based on strengthening cooperation between the MNCs and Israeli companies. The suggested financial model can be integrated as an additional program of the OCS, adding another layer to the government's efforts to support the life-sciences industry.

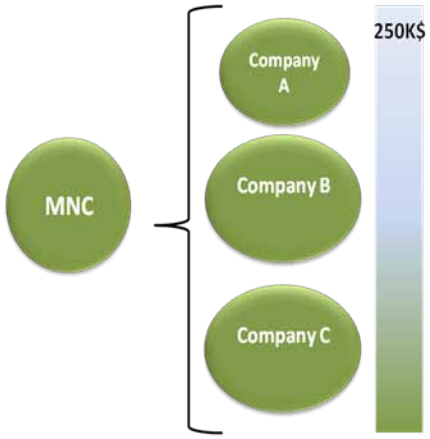
Wide Range Investment model (WRIST Model)

There are several support programs in the OCS that MNCs can use to leverage their investments in Israeli life-sciences companies. The greatest degree of commitment the MNC has is when dealing with a franchise (or partnership in a franchise) of a technology incubator. Such a model requires extensive operations in Israel with a multi-year commitment to raise incubator companies. Accordingly, the governmental support for this program is the most significant and includes 85% financing of the R&D budget expenses of the incubator companies. At the other end of the commitment scale are programs in which the MNC is involved in the activities of an individual company ("Nophar," the R&D fund or the MNCs cooperation fund). The supported financial rates and budget differ among the programs, but generally do not exceed 50% (excluding Nophar, which promotes translational research from

academia to industry).

The suggested model bridges the two worlds by offering supported financial rates above 50% in return for simultaneous investments in more than one company. Taking into account the incentives for investment in one company (for example using the R&D fund), the model suggests improved terms that make it more worthwhile for the MNC to invest in more than one company simultaneously than it would be for them to invest in the companies separately. The commitment of the MNC in this model is actually lower than the incubator model and can meet the needs of an MNC that is interested in "checking out" the existing technology of the Israeli life-science industry. On the other hand, the model provides conditions that encourage the MNC to create a critical mass of R&D activity in Israel that may lead to the growth of big local companies.

Fig 1. Wide Range Investment model (WRIST model)



Wide Range Investment model (WRIST Model) suggests upgraded conditions for simultaneously investment in couple of companies

The model principles

One of the purposes of this model is to find a balance between the needs and interests of the MNC and those of the Israeli life-sciences industry. The balance should be kept in a number of parameters that define the model:

I. **The minimum number of companies for simultaneous investment.** This number should be high enough to create a critical mass of R&D activity by the MNC but not too high as to prevent the MNC from finding relevant companies.

II. **The development stage of Israeli companies.** MNCs could invest in all stages of development (up to the first clinical trials) on the condition that they invest in a minimum

number of companies.

III. **Restricted investment.** It should be examined whether to add a limitation that restricts the investment when all the companies are in the clinical-trials stage. Among the purposes of the model is to expose the Israeli life-sciences industry to the drug-development processes knowledge and experience of the MNC necessary in the early stages of development. One possibility to bridge the gap between the needs of the government and the MNC is to set a restriction that requires the inclusion of at least one early-stage company.

IV. **A wide range of investment.** The model takes into account that there are different strategies among MNCs when investing in R&D activities outside their home countries. To increase the likelihood that MNCs will invest in more than one company simultaneously, the model incentivizes a wide range of investments -- from low investments in companies in the early stages of development to high investments in those in the clinical-trials stage. The model restricts the minimum investment to prevent investments that are too low.

V. **IP rights and the Israeli R&D law.** IP rights belong to the Israeli companies, but when R&D activity is a cooperation the IP rights are jointly owned by the Israeli company and the MNC. When the MNC is interested in buying the IP, compensation should be paid as specified by Israeli R&D law and the Israeli company should pay future royalties as specified in the R&D law.

Implementing the suggested model

- The simultaneous minimum number of companies needed for investment is set at three.
- The government will finance 66% of the project budget with the rest funded by the MNC.
- The minimum investment in a company is $250,000 a year.
- The maximum grant for a pre-clinical project is $2 million for a complete period.
- The budget is assured for a three-year period with support conditioned upon achieving milestones each year.

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