Intro d u c t

The global population has grown exponentially from 3 billion to 7 billion since 1960, and will reach 9.7 billion by 2050. Scientists struggle to keep pace with the growing need and demand for new medicines, treatments and inventions as they attempt to develop tomorrow's innovations today. However, if scientists are to continue to play a pivotal role in building 21st Century biotechnology firms that address the extremity of known and unforeseen conditions and diseases facing our society, a new form of leadership is required.

For biotechnology firms to successfully commercialize the products and services of the future, they need leaders that can lead scientists beyond the science and turn new discoveries into commercially viable products. Effective future leaders of biotechnology firms need to be “bioentrepreneurial leaders” with an entrepreneurial mindset and a bioinnovation focus.

Bioentrepreneurial leaders have the ability to effectively change the way business is conducted by creating a vision that inspires the team, utilizes its competencies to identify opportunities, and successfully turns those opportunities into breakthrough commercially viable products.

What Is a B io e n t r e p r e n e u r l e a d e r?

Bioentrepreneurial leaders are continuous learners; they are adaptable to change and flexible, they are not afraid to take risks, and they challenge existing assumptions...
with the objective of generating greater value through novel bioinnovative discoveries. They are futuristic leaders that can make a difference to the world of science and biotechnology and in doing so motivate scientists to create not just a technology but, a commercially viable opportunity. However, bioentrepreneurial leaders know that to succeed, they must surround themselves with exceptional experts in areas beyond their own skillset and trust those experts to act accordingly. This can be challenging because while they may be trained in the science, they may not have the necessary regulatory or clinical expertise to advance the concept from the laboratory to the market.

True Bioentrepreneurial leaders are characterized by their ability to effectively inspire, motivate, be creative and develop their team. They understand that they must ensure the vision of the organization is known at all levels and must inspire everyone in the firm to want to succeed. Inspiration spurs motivation and the bioentrepreneurial leader recognizes that motivation comes from a variety of sources and this is not the same for everyone. For instance, the bioentrepreneurial leader helps to build a culture that aligns personal goals with firm goals. This means that the leader must allow decisions to be made at all levels of the organization, utilizing the competencies and creativity of workers and empowering them to make decisions. Additionally, the bioentrepreneurial leader needs to create a culture where a certain amount of failure is accepted. Failure can be very difficult for biotech leaders to accept when they have traditionally been successful academically and in research. Innovation will only happen in learning organizations that develops teams which means all members of the firm must be able to continuously learn and embrace new opportunities.

**Bioentrepreneurship and Bioinnovation**

Innovation has been recognized as central to entrepreneurship’ (Hisrich and Kearney, 2013). For biotechnology firms to bring life-changing drugs, diagnostics, and treatments to market, they must master the regulations, funding, patents, FDA approval processes, combined with the increasingly dynamic, complex and competitive external environment. Bioentrepreneurship and bioinnovation are about discovering new innovations in medicines and treatments, and transforming these innovations in ways that can treat and cure diseases that will significantly improve lives, while also building a more competitive firm. Bioentrepreneurial leaders can champion bioinnovative ideas, provide necessary resources or expertise, and ultimately institutionalize the bioentrepreneurial activity within the firm’s system and process. When resources are limited, as is often the case in biotechnology firms due to the extreme cost of developing and commercializing products, workers need to know that the leader will do everything possible to remove obstacles and support innovative thinking. Even when inevitable failure happens, the true bioentrepreneurial leader does not blame, but learns.

**Bioentrepreneurship and Bioinnovation**

Bioentrepreneurial leadership at all levels is at the core of bioinnovation. This becomes even more fundamental with the increased convergence of different areas of expertise (drugs, IT, diagnostics, biomarkers, surgery, robotics and so forth). Again, successful leaders of such firms must continuously learn and adapt to highly dynamic situations that are often dissimilar in their leadership needs. For instance, the research laboratory is often highly collaborative and processes are easily changed. The product development and production processes may be highly regulated which means processes once defined may not be easily changed. These leaders must anticipate disruptive market events and trust their key lieutenants to do their jobs—a task that is often difficult when stakes are high. Bioentrepreneurial leaders instill a strong commitment among the team. In doing so they need to identify the key stages of the innovation process specific to their firm and the necessary competencies and technologies that are required at each stage. Additionally, they must utilize all possible resources to identify each potential opportunity for bioinnovation and take appropriate action to accelerate the science that will give the firm a competitive edge. These resources include:

- **Tangible Assets** (such as plant, equipment, finances and location)
- **Human Assets** (employees, their skills and motivation)
- **Intangible Assets** (such as technology [patents and copyrights], culture and reputation).

It is clear that bioinnovation is not a one-time implementation but rather a continuous process that needs to be supported and facilitated by effective bioentrepreneurial leadership that builds the necessary culture throughout the entire organization. Bioentrepreneurship and bioinnovation must be embedded into the culture of the
firm and become the core of 'the way things are done around here'. Bioentrepreneurial leaders recognize the importance of developing and supporting a culture that focuses not only on scientific goals, but also on people and management. This is necessary to create a culture that encourages scientific discovery by eliminating obstacles that inhibit opportunity identification, promotes effective teamwork that utilizes the core scientific competencies of the team, ensures availability of resources and is totally committed to R&D with the objective of commercializing breakthrough scientific discoveries.

As depicted in figure 1, we believe that bioinnovation is manifested through effective bioentrepreneurial leadership. The core role of leader is to continuously learn and adapt and create a shared vision with the whole firm. The leader must utilize the competencies of the team to identify and commercialize new scientific discoveries, in a conducive environment, that supports the team to develop new innovations.

**Conclusion**

Without bioentrepreneurial leadership, many discoveries will not make it to the marketplace. Biotechnology scientists, by nature, tend to work for the greater good and hope that their discoveries will benefit mankind. Yet it is often the hyper focus on addressing the scientific and technical aspects of a problem that leads to difficulties. A dilemma exists, as scientists do not generally have the necessary skills or mindsets required to meet commercial or monetary milestones to successfully commercialize products. Therefore, bioentrepreneurial leaders must themselves be willing to continuously learn and adapt to a dynamic industry and at the same time they must inspire and motivate employees at all levels of biotechnology firm to also learn and adapt. Creativity and innovative thinking are required at all stages, and across all disciplines in the organization. Only when this happen will the firm succeed with new innovations through product development and commercialization.

**Reference**
