WHAT MIDPHARMAS SHOULD DO ABOUT **ARTIFICIAL INTELLIGENCE** IN **DRUG DISCOVERY**

Novasecta

AI HAS THE POTENTIAL TO TRANSFORM DRUG DISCOVERY

Artificial intelligence (AI) has emerged as having the potential to transform and significantly accelerate drug discovery, and so its integration has become a pivotal focus for pharmaceutical companies. Drug discovery is still a slow process with a low success rate. AI is a promising technological tool that enables scientists to overcome these challenges and accelerate high-quality drug discovery.

Generative AI (GenAI) is one of many AI technologies driving this change, as it can generate new data by leveraging learnings from existing data. In the context of drug discovery, GenAI can generate novel structures that have the potential to become lead compounds.

AI is important for pharmaceutical companies and biotechs of all sizes, including MidPharmas (those with revenues from €100m to €10bn). The scale and heritage of MidPharmas make it challenging to adapt to emerging technologies. MidPharmas have limited financial and human resources, making acquisitions riskier and the integration of technology more difficult. They may also find it difficult to attract relevant talent to fill capability gaps and establish a mindset open to new technologies.

MidPharmas should be prepared to capitalise on AI developments with caution and thoughtful resource allocation. In this paper, we outline what MidPharmas are doing and what they should do about AI in drug discovery, highlighting the importance of mindset, strategic collaborations, and iterative adoption.

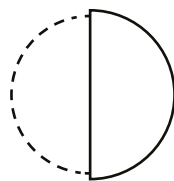## MIDPHARMAS ARE BENEFITING FROM EMBRACING OR EXPLORING AI

MidPharmas take three different approaches to adopting AI in drug discovery:

- **Embracer** companies demonstrate mature internal AI initiatives, significant resource allocation to AI, and multiple high-quality external collaborations
- **Explorer** companies adopt AI iteratively and selectively participate in a limited number of external collaborations
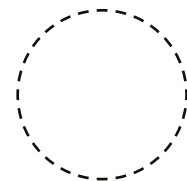- **Doubter** companies are not proactively engaging with AI

MidPharmas that are Embracers or Explorers enhance their competitive position, by generating innovative drug candidates faster and cheaper than by traditional methods.
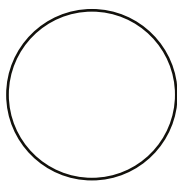
Embracer	**Explorer**	**Doubter**
Significant AI Adoption	Partial AI Adoption	Negligible AI Adoption

Embracers are willing to accept the risks linked to investing in novel technologies and solutions.

> **Example:** Dompé has developed an internal proprietary drug discovery AI platform (Exscalate) and formed multiple strategic partnerships to leverage its use, including one with Engitix Therapeutics which gives restricted access to Exscalate in exchange for milestones and royalties.

> **Example:** Merck KGaA has a dedicated AI research team and recently announced two strategic partnerships with AI biotechs Exscientia and Benevolent AI to accelerate drug discovery.

Explorers do not expose themselves to the same level of risk as Embracers do. As applying AI in drug discovery is still in its relative infancy, adopting AI incrementally enables Explorers to learn from industry leaders and choose established AI solutions to effectively mitigate risk. Explorers are also well-positioned to adapt their strategies as AI-driven drug discovery technology is evolving.

> **Example:** In 2019, UCB began a collaboration with Iktos, a biotech developing AI solutions, to accelerate drug discovery. Two years later, in 2021, UCB further adopted AI by announcing a strategic collaboration to combine Microsoft's AI with UCB's drug discovery capabilities.

> **Example:** In 2022, Servier entered collaborations with Google to incorporate AI into drug discovery. This was followed by a more recent announcement this year: a partnership with Owkin, a biotech focused on applying AI to drug discovery, development, and diagnostics.

Not proactively engaging with AI has been understandable due to the limited visibility of how AI works, complicating the selection of appropriate initiatives. There are concerns about the necessity for specific new capabilities and cultural change. Additionally, the initial implementation costs are high without ensured returns. However, MidPharmas that do not invest in AI risk falling behind peers that do. Doubting AI is no longer an option.

MIDPHARMAS MUST APPLY AI IN DRUG DISCOVERY TO STAY COMPETITIVE

To navigate this rapidly evolving landscape successfully, MidPharmas should:

1. **Build the right mindset.** MidPharmas should foster a culture of openness and agility that empowers their teams to readily embrace new AI initiatives, leading to a mindset shift that complements traditional drug discovery practices. This will allow MidPharmas to respond to the rapidly evolving industry trends and emerging AI applications.

2. **Engage in quality AI collaborations.** MidPharmas should engage in selected high-quality strategic partnerships with specialists that possess validated AI solutions, including AI-focused biotechs and Big Tech. This will mitigate the risks associated with AI adoption while having access to advanced technologies and relevant capabilities.

3. **Adopt AI iteratively.** MidPharmas should take an incremental and iterative approach to AI adoption. This involves engaging with a few AI initiatives and subsequently iterating the AI adoption strategy based on the outcome of each initiative. This will foster an agile AI integration process with reduced risk.