BB Biotech

Expert commentary

Creating blockbuster drugs using algorithms

Artificial intelligence is becoming an increasingly important tool in the drug discovery and development process. Biotech investors benefit from this technology too.

Dr. Samuel Croset, Data Scientist BB Biotech at Bellevue Asset Management

Artificial intelligence and machine-learning algorithms are disruptive technologies that are having a two-fold impact on the drug discovery process. Firstly, the technology can be applied to save time and money during the process of identifying molecular targets for drug development purposes. Secondly, thanks to the availability of a massive amount of data, clinical trial design and patient selection can be approached in new ways that likewise save time and money and also importantly lower the risk of trial failure significantly.

In addition, artificial intelligence tools can improve the depth of the due diligence effort part of the stock selection process for biotech investors by allowing them to synthesize a broader set of data. Artificial intelligence will not replace portfolio managers, but it can provide them with additional insights for fundamental investment research purposes that makes it much easier for them to screen and select the right stocks within the given investment universe.

Over the past few years BB Biotech has integrated huge volumes of datasets into its own IT infrastructure, covering a wide range of data types. This pool of data contains patient-derived data, insurance claims, fundamental information about drugs, news, published studies, reports, scientific literature, as well as information gathered through the Portfolio Management Team's international network of contacts. The insights that can be gained through the analysis of this data are just as wide-ranging as the sources from which it is collected. Examples include characterizing the commercial potential of a drug candidate based on the mechanism of action, competition, as well as quantifying the epidemiology and unmet medical need of patients. The data is also used to understand patient journey and flow in the medical system, by looking at reimbursement patterns within insurance companies, the ultimate payers for marketed treatments.

More specifically, taking the treatment of major depression as an example, advanced analytics help to understand the following complex questions: In the real-world, how many of the patients are not responding to a therapy and switched from one treatment to another? After how long? For which reasons? What are the claimed medical benefits for the currently approved medicines? How often must the approved drugs be taken and what is their method of administration – patient-friendly oral administration, for example, or injection?

Impact across therapeutic areas, with a focus on oncology

We are convinced that advanced analytics will lead to significant medical progress, especially in oncology, area where large amounts of patient and real-world data have been amassed, which facilitates the process of identifying compounds with the best efficacy profile, as well as patients being most receptive to a drug, leading to a product with the greatest market potential. Aside oncology, there are a number of companies developing novel drug candidates in every therapeutic area, in particular neurology/psychiatry and auto-

immune diseases, in order to segment better heterogeneous patient population using AI-discovered biomarkers and drug targets.

Biotech companies themselves are deploying algorithm-based tools for research and development purposes. The number of companies that are fully focused on computational biotech, using artificial intelligence and machine learning in their approach to biotech drug discovery or development, has been growing since about 2015, and most of them are still reliant on venture capital funding. Most of computational biotech companies have focused their research and development activities on neurology and cancer. As for the types of drug classes studied, traditional small molecule drugs clearly predominate, followed by biologics (antibodies and peptides). Small molecules are appealing, as they are more easily developed as well as because more AI tools and research is available about them.

The coming years will reveal just how promising and viable drug candidates developed with the help of AI tools actually are. A growing number of product candidates developed with the help of AI are entering Phase II testing yet the majority of therapeutics (42%) being developed using artificial intelligence technology are in the preclinical stage of development.

Expanding data science capabilities
BB Biotech will be closely monitoring developments in the field of computational biotech during the coming years. Two of the companies in its portfolio are pursuing AI approaches in their drug discovery and development programs. Relay Therapeutics has three cancer drugs in advanced clinical studies targeting pathogenic proteins that were previously not viable molecular targets for the development of new therapeutics. It recently published very convincing clinical data on its lead FGFR2 inhibitor product candidate. Black Diamond Therapeutics, the other portfolio company, is deploying machine-learning technology to develop novel precision cancer therapies that are designed to work across a number of tumor types.

BB Biotech sees tremendous potential in the use of artificial intelligence, to support both investment decisions by the portfolio team and to develop novel drugs, The Portfolio Management Team has significantly expanded the data science capabilities and recently recruited two additional specialists.

Author
Samuel Croset joined Bellevue Asset Management as Portfolio Manager and Digital Transformation Lead in 2020. He previously worked for Roivant Sciences from 2018-2020 as data scientist supporting investment decisions in drug projects as well as leading a team focused on the analysis of real-world data. Prior to that, he started his professional career at Roche as data scientist in the research department (2014-2018). Samuel holds a Ph.D. in Bioinformatics from the University of Cambridge, a MS in Bioinformatics and a MS in Biochemistry from the University of Geneva.

For further information:

Investor Relations

Bellevue Asset Management AG, Seestrasse 16, 8700 Küsnacht, Switzerland, tel. +41 44 267 67 00
Dr. Silvia Schanz, ssc@bellevue.ch

Maria-Grazia Alderuccio, mga@bellevue.ch
Claude Mikkelsen, cmi@bellevue.ch

Media Relations

Bellevue Asset Management AG, Seestrasse 16, 8700 Küsnacht, Switzerland, tel. +41 44 267 67 00
Tanja Chicherio, tch@bellevue.ch

www.bbbiotech.com

Company profile
BB Biotech AG is an investment company with its registered office in Schaffhausen/Switzerland and listed on the Swiss, German and Italian stock exchanges. It has invested in innovative drug developers headquartered primarily in the US and Western Europe. BB Biotech is one of the world's largest investors in this sector. The competent Board of Directors with its long-standing experience set the investment strategy and guidelines. Investment decisions are taken by the experienced investment management team of Bellevue Asset Management AG based on their extensive investment research.

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