Hyper Personalized Drug

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Press Release

Amazon introduces AGEM Antidiabetic custom drug to treat diabetic patients

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As there is no permanent cure to diabetic patients, Amazon Healthcare has introduced AGEM customized drug to cure diabetes that will adopt Hyper Personalized Drug technology.

SEATTLE – (BUSINESS WIRE) – APRIL 21, 2020 – Today, Amazon (NASAQ – AMZN), announced the launch AGEM custom drug using the technology reviewed by Massachusetts Institute of Technology, where they help patients recover from diabetes by triggering the patient's pancreas to release required amount of insulin. There is no permanent cure to diabetic patients, but our customized drug helps patients to generate the required insulin by pancreas changing the genome sequence and eventually cure this disease. Amazon uses the hyper personalized drug technology to develop this medicine.

Diabetes disease and the organs damaged by them in patients constitute a major health problem in the society. This disease is caused when the patients' blood glucose level increase and doesn't have enough insulin to blood to convert this sugar to glycogen. Patients with underlying diabetic disease may develop organ failures and they can be treated with AGEM customized drug for those patients by controlling their pancreas to generate enough insulin. The modern medications just induce some amount of insulin into blood and the patient has to inject insulin every day in order to maintain the blood sugar level. Injecting insulin every time is costly, inconvenient, takes time to adjust to patients' body, cause skin problems, Ketosis, and changing infusion sets over couple of days.

The recent study shows that about 415 million people in the world are suffering from diabetes. And about 34 million people in US alone are suffering from this. It is estimated that the global figure goes up to 642 million people living with diabetes worldwide by 2040. So, Amazon want to solve this problem of insulin production in the body by customizing the required drug for each patient.

This is wherein the need for customizable drug for each patient is needed. Here, the amount of insulin required by each patient is analyzed and develop a customized drug. This drug makes changes to the genes of pancreas to generate enough insulin into blood and maintain the blood sugar level. With the technology developed by MIT, AGEM personalized drug won't release more or less insulin unlike traditional drugs. It cures by making insulin production normal.

The drug activates the pancreatic cells and helps them to generate the required insulin. So, patients wont relay on injecting insulin every day. With this we at AMAZON is solving a biggest challenging problem with a best possible solution. "Nothing is more important than saving lives".

About Massachusetts Institute of Technology

The Massachusetts Institute of Technology (MIT) is a private research university in Cambridge, Massachusetts. The university was founded in 1861 and since then it played an important role the development of science, technology, engineering, and mathematics. For more than 150 years, the university has shown a significant amount of contribution to the research and development in their 33 departments, six schools many centers, labs and programs. The university is well known for solving many of the challenging problems in the world with technological solutions. MIT has come all the way contributing to defense research, improving treatments for diseases by collaborating with many universities, leading research institutes and governments around the world.
For more information visit www.mit.edu

About Amazon

Amazon vision statement is "to be Earth's most customer-centric company, where customers can find and discover anything they might want to buy online" and is guided by customer obsession, Ownership, innovate, Earn customers trust, and long-term thinking principles. The products and services offered by Amazon are e-commerce, prime services, AWS, Alexa, Echo, Fire, Fire TV, and Amazon Kindle.
For more information visit https://www.aboutamazon.com

FAQs

1. **What is a Genome?**
   Genome is a set of haploid set of chromosomes in each cell of an organism.

2. **What is Hyper personalized drug?**
   The drug that cures the patients by changing genome sequencing.

3. **What is a Custom drug?**
   The custom drug is used by doctors around the world to select the treatments which helps patients based on a genetic understanding of their disease.

4. **Does the custom drug is available to public?**
   Yes, the custom drug is available to public upon prescribed by doctors.

5. **How does custom drug differ from traditional medicine?**
   In traditional medicine, scientists develop a drug that treat the symptoms of the disease. Custom drug goes one step further, where doctors use information about the patient and their characteristics of the disease to treat.

6. **What are the benefits of using Hyper personalized drug?**
   There are many benefits of using hyper personized drug, prominent are it predicts the susceptibility of disease, improve disease detection, preempt disease progression, prescribe more effective drug, and avoid causing side effects.

7. **What is the most important challenge of Custom drug?**
   Individual privacy is the biggest concern in the precision medicine. Even though the information will be de-identified, the stored data is highly personal and sensitive.

8. **What are the barriers to research and develop a custom drug?**
   In diabetic research there is a limited power to detect associations, which is a function of the frequency of the genetic variant, the magnitude of the effect to be detected.

9. **What steps are taken to customize a drug?**
   First the patient's medical history is collected, the disease he/she is facing, and customize drug to change their genome to cure the disease and the required sample size for research.

10. **Is it legal to import custom drugs if not available in the united states?**
    Yes, the importing is legal if that drug is approved by U.S Food and Drug Administration.

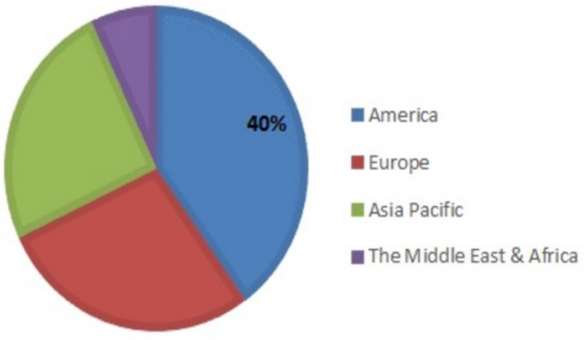
Appendix

Key Assumptions

- Custom drug is personalized to treat a single patient by changing his genome sequence.
- This drug is sold to hospitals, pharmaceuticals, healthcare agencies and government organizations.
- This custom drug is not costly, convenient, quickly adjust to patients' body, doesn't cause side effects, and easy to take.

Customer Segment

We have developed this drug wherein it will help us to save many diabetic patients and lives with hyper customized drug solution. In the short term, our customers are the Hospitals, pharmaceuticals, Healthcare Centers, Emergency Units, Clinics, Medical Schools, Intensive Care Units, Government organizations, Licensed Medical Partners, and Defense Units. All these organizations were approved by the government in order to use custom drugs on patients. Upon recommendation from doctors these drugs will be used.
Later, we want to work with NGOs who are working on providing healthcare to people in need. We look forward to work with them and save people's lives. In the long-term projected customers can directly buy these custom drugs with doctor prescriptions.



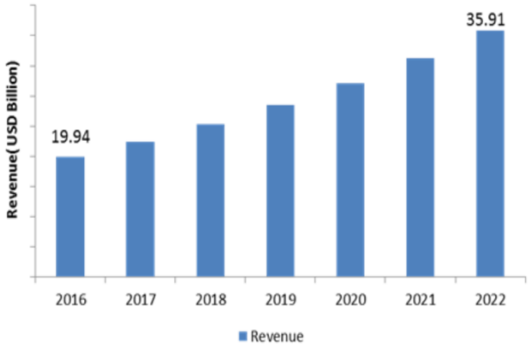


Figure 1: Market share of custom diabetic drug by continent 2023 Figure 2: Antidiabetic drug revenue forecast for 2022

Figure 1 illustrates that the forecasted market share for custom diabetic drug of different continents for 2023 accordingly we can target different markets. We could see that there is a huge growth in the antidiabetic drug market in the coming years. It can be seen that there is a

huge demand to treat diabetic patients and the revenue is almost doubled from 2016 to 2022 and this can be seen in the second figure.

Unmet Needs

Nowadays there are many diseases where there are no vaccination/drugs in order to cure them. The use of hyper personized drug technology in the drugs will be able to cure many people having these diseases. The below table explains the need for customizable drugs.

Antidiabetic Traditional Drug	**What is the Need?**	**Unmet needs by antidiabetic custom drug**
Injects Insulin in patients body every day.	One-time treatment	Targeting pancreatic cells to change their genome and make them produce required insulin.
Everyday treatment makes it costly.	Low cost drug	Low Cost
Inconvenient to use	Convenient Drug	The customized drug is convenient to use.
More than required insulin is injected	Need for required insulin	Normal insulin is produced in the body after taking the drug.
Cause side effects due to overdosage	Drug without side effects	No side effects.
Changing infusion sets over few days	Need for one set	One-time treatment
Change in patients' diet	To follow normal diet	Can follow normal diet after the drug usage.

Therefore, the need for customized drug to cure the diabetic patient is patient is paramount.

Pricing

The development of the custom drug by using the labs equipment increases the cost of each drug. But the mass production of these custom drug based on the group of patients reduces the price. Even though developing these drugs costs more than traditional drugs, they have best advantages over normal drugs. We make contract with hospitals and other organizations in order to reduce the price. Starting we are manufacturing 1000 antidiabetic custom drugs.

Our major investment is research and development as we have to gather all the required data and develop a customized drug for each patient. And another investment is on chemicals to develop the medicine. Since it is a customized drug the price varies in the range of $75,000 - $100,000 depending on the medicine. In total it will cost us $100,000 to produce one customizable drug. Under the first contract we are developing 1000 drugs.

Research and Development – $50 Million

Manufacturing Drug – $20 Million

Required chemicals - $15 Million

Others - $5 Million

Total approximate cost for producing 1000 antidiabetic custom drug, we are charging $120 million for those who sign contract with us for 5 years, else the charge will be $150 million for one time dealing.

Roadmap

Themes	Q1	Q2	Q3	Q4
Goals	Antidiabetic custom drug release	Expanding the product to new market	Addition of new chemicals and release the Drug to with better results	
R&D	Collect the required data and Development of the drug	Improving drug to give better and fast results		Test the drug and ready for the release
Marketing	Marketing the product and Creating Awareness about the Custom drug	Promoting the drug	Getting feedback on the drug results	Carry out digital marketing
Planning	Finding out the required chemicals for the drug	Using new chemicals and testing new drug on animals		Get approval for the release of new form of antidiabetic custom drug

Key Metrics

Quantitative Metrics	Qualitative Metrics
R & D expenses per new drug developed	Drugs approved by FDA
Prescriptions filled per hospital or pharmacy	Number of patients recovered and failure rate.
Number of new custom drug developed in one year	Customer ratings for the drug
Number of goes to testing per quarter	Operations and services for use of drug

Operational Needs

Research and development team: This is the main team in development of a customized drug. They are responsible in developing and customizing the drug for each patient.
The team of Doctors: Doctors are responsible in order to check the drug chemical components and test it on animals.
Marketing Team: They are responsible for promoting the drug and making contracts with the customers. They create awareness of saving lives of people.
Finance Team: Finance team is responsible for allocating money to research and development, marketing the product and other required services for the drug manufacturing and marketing.

Legal Team: Legal team is responsible to get the approval for the drug, required license to sell it and to make sure selling the drug to the right healthcare providers, and to carry out any legal issues.
Operations Team: They are responsible for maintaining and servicing use of the drug.

Addressing Risks/Caveats

Risks are part of any great innovation. With that being said we have to minimize the risks and increase the productivity.
Development Risk: As the drug is customized to each patient, there should be microlevel precision to develop it or else the drug will fail. This has to be done each and every time. It is time consuming and needs lot of resources. This can be mitigated by testing each and every stages of development to give the right results.
Production Risk: There is few production risks as the chemicals to manufacture the drug should be transported with care and hygienic and inadequate quality and supply of the required chemicals poses a bigger risk. Using of unsealed chemicals and without sterilization poses a risk on the patients' health. This is mitigated by storing extra chemicals for emergency and sterilizing each and every chemical as and when required.
Usage Risk: There is a usage risk of the drug. The incorrect dosage prescribed by doctors is a danger to patients' life and sometimes causes serious threat to their lives. So, the drug should be given with a proper dosage at the correct interval of time.
Legal Risk: Finding out right customers authorized by governments is challenging and selling it to wrong customers will be a bigger risk. And to get the raw materials from the trusted parties is also extremely important. Any mistakes in them causes a legal risk.

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