

METHOD OF OBTAINING BChE ENZYME IN BIOSENSORS PRODUCTION

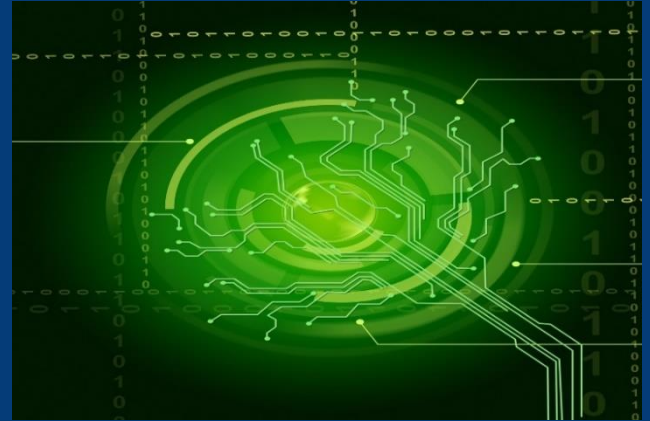
Market

The growth for Biosensors Market is caused by the emergence of latest nonmedical applications, technological developments in micro-fluids, chronic health conditions leading to rise in home diagnostics and expansion of usage in Point of Care (POC) testing, and extension of range of medical (36%) and nonmedical applications. They may be used in a variety of ways like screening for diseases, veterinary and agricultural applications, environmental pollution control and military. According to Global Data, Medical Intelligence Center, Pharma Intelligence Center, McKinsey and Euromonitor International data it is expected an increase in the market value from USD 9273 mln in 2018 to USD 20680 mln in 2023. The market value will have been rising at a 5Y CAGR of 17,4%.

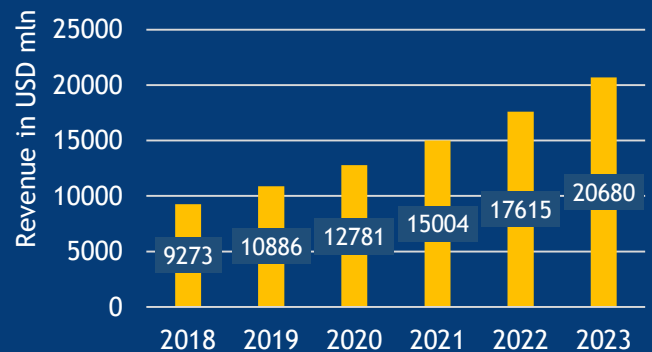
Technology

Offered technology is method of obtaining biologically active recombinant enzyme of butyrylcholinesterase (EC 3.1.1.8; BChE) and its derivatives using molecular cloning methods, genetic expression and biochemical isolation, and method for obtaining biologically active cholinesterases and butyrylcholinoestaras and their derivatives in microorganism *Leichmania tarentolae* using molecular cloning methods, genetic expression and biochemical isolation. Technology enables production of biologically active recombinant butyrylcholinesterase enzyme (BChE) and its derivatives. Offered technology allows for BChE enzyme to be obtained at higher efficiency, with exceptional purity and lower costs than existing isolation methods from plasma or enzyme production in transgenic plants or insect larvae.

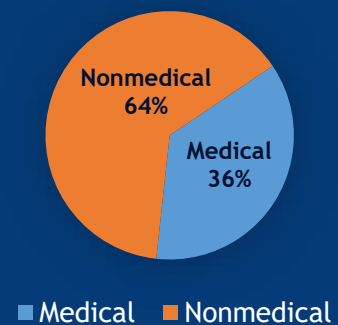
Opportunity Analysis and Forecasts to 2023



Market - Biosensors, Drugs, Antidote
size and forecast for 2018-2023¹



Biosensors Market
acc. to the application²



Source: 1 i 2: developed on: Global Data, Medical Intelligence Center, Pharma Intelligence Center, McKinsey, Euromonitor International, 2017

Technology highlights

- 1 BChE enzyme constitutes a key element of biosensors detecting Chemical Weapon Agents (CWAs) and pesticides from the organophosphorus (OP) group. It can be used for production of personal chemical contamination sensors.
- 2 Besides application in biosensors construction, recombinant BChE can be used, for example, as an effective antidote after exposure to Chemical Weapon Agents (CWAs).
- 3 The offered enzyme BChE is of exceptional purity, comprising homogeneous protein preparation.
- 4 Offered technology allows for the enzyme BChE to be obtained at higher efficiency, with exceptional purity and lower production costs than existing isolation methods.
- 5 Enzymes acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) from ChE group have found many civilian and military applications.

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Commercialization opportunities



- ➔ Licensing relationship
- ➔ Partnership for further studies and commercialisation
- ➔ Transfer of ownership

IP Status



The invention was submitted for patenting according to Polish P.423116 procedures.

Implementation progress



TRL 4
Technology validated in laboratory conditions

Summary

The subject of invention is method of molecular cloning, genetic expression and production of recombinant BChE and ChE enzymes based on gens. Enzymes belonging to cholinesterase (ChE) group: acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) play important biological role in signal transduction within the nervous system (AChE) and natural detoxification of the organism (BChE). Both they are capable of decomposing wide spectrum of compounds possessing ester linkages in structure, as well as binding and inactivating organophosphorus (OP) compounds. Due to their qualities they may be widely used in civilian and military applications, including detoxification following exposures to organophosphate pesticides, snake and insect bites, drug overdoses, traumatic brain injury or neurodegenerative diseases such as dementia, alcoholism and Alzheimer's disease. Widespread use of organophosphorus compounds as pesticides, as well as Chemical Weapon Agents (CWAs), threatens health and lives of both military personnel and civilian population. As a result, there is a great need to develop technology for the rapid and efficient detection of contamination with organophosphorus compounds. Military and dual-use applications of ChE include actions towards ecosystems and people protection. They consist in early warning and toxic compounds removal.

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