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No. 010/1/2018

MEDICAL APPLICATIONS OF ETHYLBENZENE 2-ISOTHIOCYANATE IN HUNTINGTON'S DISEASE

Market

Huntington's Disease (HD) is classified as a genetic neurodegenerative disorder. The incidence of the disease varies worldwide, with reported prevalence rates of 1 in 15 000 people in developed countries. HD is a serious social and economic burden, mainly due to high costs of care, amounting to approximately 25 000 euro per person per year.

According to report Drug Discovery Services Market by Process (Target Selection, Hit-to-Lead Identification, Lead Optimization), Type (Medicinal Chemistry, Biology Services, DMPK), Drug Type (Small Molecules, Biologics), Therapeutic Areas (Oncology, Neurology) - Forecast to 2022 medicine market is estimated expand to $ 14,4 billion by 2022.

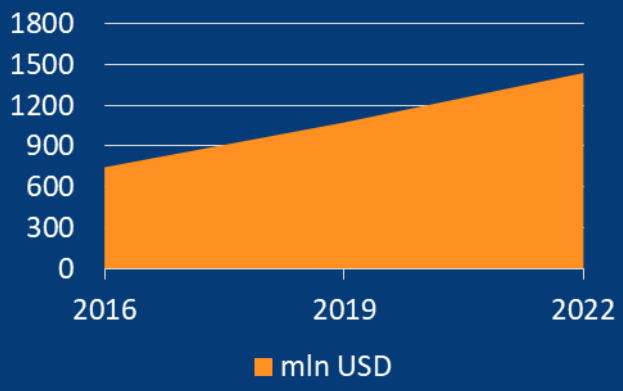
Technology

Investigation of the effect of isothiocyanates on the degradation of proteins in cells revealed that phenethyl isothiocyanate (Ethylbenzene 2-isothiocyanate), the compound formed from gluconasturcine naturally occurring in brassicaceae plants, causes a reduction in the level of the mutant form of huntingtin and its aggregates in cultures of human cells.

Ethylbenzene 2-isothiocyanate (phenylethyl isothiocyanate) is used for the preparation of a drug substance actively inhibiting the formation of protein aggregates in a cell, including aggregates of mutant huntingtin preventing their accumulation and activation process of their removal by the cell.

Opportunity Analysis and Forecasts to 2022

Market of medicinal products.



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Technology highlights

1. Ethylbenzene 2-isothiocyanate has properties that reduce the total level of mutant huntingtin in cells.
2. Phenethyl isothiocyanate does not cause a significant change in viability of normal cells.
3. The substance prevents the gathering of mutant huntingtin aggregates in the cell, which leads to a reduction in the number of cells with mutant huntingtin aggregates and a significant increase in the number of cells free of aggregates.

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Commercialization opportunities

- Licensing agreement
- Transfer of ownership
- Spin off

IP Status

The invention was submitted for patenting according to Polish (P.421685) procedures.

Implementation progress

TRL 4
Technology validated in laboratory conditions

Summary

Huntington's Disease is an incurable, hereditary and progressive neurodegenerative disease characterized by a combination of disorders of motor functions, cognitive abilities and behaviour, leading to disability and premature death. At molecular level the disease results from a mutation in the IT15 (HTT) gene encoding the huntingtin protein (HTT). Existing pharmacological therapies and physiotherapies primarily serve to alleviate the symptoms of the disease such as movement disorders, personality changes, deterioration of intellectual abilities, changes in behavior and mood (including depression, apathy, anxiety, irritability and others). Phenethyl isothiocyanate is a potential drug in Huntington's Disease.
Invention described herein allows for Ethylbenzene 2-isothiocyanate to be used as an active ingredient of novell formulation, which causes a reduction in the size and number of protein aggregates and a decrease in the total number of mutated huntingtin forms. This in turn may result in significant slowdown or even complete inhibition of Huntington's Disease progression. Research results show that phenylethyl isothiocyanate doesn't cause significant changes in viability of normal cells.

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