

6-2014-2984 | Platform Technology for Synthesis of Natural Compounds
[Tselikhovsky Dmitry](#), HUJI, School of Medicine - IMRIC, School of Pharmacy- Institute for Drug Research

Category	LifeSciences and BioTechnology
Keywords	Natural compounds, Synthetic compounds, Neurodegenerative disorders
Current development stage	For Pharmaceutical development: TRL4 - POC & Safety of candidate drug formulation is demonstrated in defined animal model

Application

Many important biochemical compounds and drugs of natural origin contain spirofuranone ring structures. The strong physiological effect of such compounds, have led to long-term efforts to synthesize therapeutic agents that possess their characteristics.

Numerous studies have produced variety of modern drugs and potential pharmaceutical candidates that share the compact tricyclic systems, such as:

- Alliacanes (displaying antimicrobial activity and inhibition of DNA synthesis in the ascetic form of Ehrlich carcinoma)
- Arteannuins (antimalarial agents)
- Allamancins (antileukemic activity)
- Teucrolins (possessing a range of biological activities including antioxidant, antiseptis, anti-inflammation, antipyretic, analgesic, and antifeedant activities), and others.

Since these molecules are naturally produced in small quantities (e.g. in plants, fungi, microbes, and marine organisms), there is significant interest in mass-producing them through a synthetic pathway. Unfortunately, access to a large number of these target molecules and their structural analogues is either unknown or hindered by their multistep syntheses. Furthermore, many compounds can only be harvested from their natural source, a process that can be tedious, time consuming, expensive, as well as wasteful of the natural resource.

Therefore, there exists a long sought after need in the industry to provide a general or common approach towards the construction of naturally occurring complex structures such as quaternary carbon-centered tricyclic spiranoid lactones and their natural derivatives.

Our Innovation

A novel synthetic strategy using simple production steps to create tricyclic skeletons in a rapid and efficient manner. The synthesized compounds may serve as potential drugs for a variety of disorders, mimicking the effects of natural origin biochemical compounds.

One of those compounds, the family of methylene-cycloalkylacetate-based molecules (MCAs), modulate neuronal cell properties and operate as acceptable pharmacophores for the development of novel neurotropic (neurite outgrowth inducing) lead compounds.

Technology

- A library of novel synthetic compounds with similar therapeutic effects to natural origin drugs
- Specific synthetic compounds with neurotropic activity

Opportunity

- Screening a library of novel synthetic compounds which mimic the activity of natural origin compounds for various indications
- A unique family of methylene-cycloalkylacetate-based molecules (MCAs) that may serve as treatment for a variety of neurodegenerative disorders. The MCA drug may be successfully constructed through the simple and straightforward sequence of synthetic transformations from commercially available starting materials.

Additional Reading

Methylene-Cycloalkylacetate (MCA) Scaffold-Based Compounds as Novel Neurotropic Agents.; Lankri D, Haham D, Lahiani A, Lazarovici P, Tselikhovsky D.

ACS Chem Neurosci. 2018 Apr 18;9(4):691-698. doi: 10.1021/acschemneuro.7b00473. Epub 2017 Dec 29.

Patent Status

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Contact for more information:



Keren-Or Amar
VP, Business Development, Healthcare

Yisum Research Development Company of the Hebrew University of Jerusalem

Hi-Tech Park, Edmond J. Safra Campus, Givat-Ram, Jerusalem

P.O. Box 39135, Jerusalem 91390 Israel

Telephone: 972-2-658-6688, Fax: 972-2-658-6689