

6-2014-2984 | Platform Technology for Synthesis of Natural Compounds  
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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, antisepsis, 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/acscchemneuro.7b00473. Epub 2017 Dec 29.

### **Patent Status**

Granted US 10,392,338

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