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*Molbank* is a unique electronic journal that rapidly publishes very short articles, which typically encompass one compound per paper (“short notes”) as well as “communications”. The aim of this format is to prevent potentially useful scientific information from being lost. In many research groups, there are unpublished compounds that are available, which do not truly fit into a full paper or even a conventional short paper, e.g. because the main work in a series of compounds has already been published. Nevertheless, somebody else might be interested in just this particular compound. *Molbank* offers an excellent platform for preserving the aforesaid kind of information.

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*Molbank* is a communication journal of synthetic chemistry and natural product chemistry. It publishes “short notes” of experimental data records for previously unpublished single molecules (one compound per paper) as well as “communications” of preliminary but significant results that can involve more than a single compound. For “short notes”, any scattered unassembled experimental data for individual compounds which is conventionally not publishable is particularly welcome. Articles that focus primarily on new structure determinations are acceptable also for previously known compounds.

*Molbank* has been launched to preserve and exploit molecular diversity of both chemical information and chemical substances.

The scope of *Molbank* is reflected by its three journal sections:

- Organic Synthesis
- Natural Products
- Structure Determination

Please visit the journal website at <http://www.mdpi.com/journal/molbank> for more information.


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#### Crystal Structure of Bis(2,4,6-trimethylphenyl)-phosphine Oxide (1422-8599/2017/3/)

by [Alex J. Veinot \(https://sciprofiles.com/profile/author/Tm4yUVowU0QzbUFFSjFaTHJuVUFabWp0QjBoZzhXWEFib1dYR0R3eVJuVT0=\)](#), [Ketnavi Ramgoolam \(https://sciprofiles.com/profile/author/eFlrMXBHRzZVa0M5elhiQWF0eCtpUXBsQ1VvREdERmxTR3VGMThTVVpvQT0=\)](#), [Nick A. Giffin \(https://sciprofiles.com/profile/author/amp0N2JEVEFoZE1uUkJlZnBjSDFTaVBMVERnQ2t5S0dxRmFsbXY5Mm1XYz0=\)](#), and [Jason D. Masuda \(https://sciprofiles.com/profile/310774\)](#)

*Molbank* 2017, 2017(3); ; <https://doi.org/10.3390/M957> (<https://doi.org/10.3390/M957>) - 19 Sep 2017

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**Abstract** The single crystal structure of bis(2,4,6-trimethylphenyl)phosphine oxide has been determined. All interatomic distances and angles can be considered normal. The aryl substituents adopt an intermediate configuration when compared to both sterically unhindered (e.g., diphenylphosphine oxide) and congested (e.g., bis(2,4,6-tri-*tert*-butylphenyl)phosphine oxide) secondary [...] [Read more](#).

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#### (1R,2S,5R)-2-Isopropyl-5-methylcyclohexyl 4-Aminobutyrate Hydrochloride (1422-8599/2017/3/)

by [Mariia Nesterkina \(https://sciprofiles.com/profile/171920\)](#), [Svitlana Shishkina \(https://sciprofiles.com/profile/author/OFdleGiwYmVGT29WTEpxblRySE5qcy9sbmFZRWlVtkZJbVpCSnZ0Y05OTT0=\)](#), [Georgy Maltsev \(https://sciprofiles.com/profile/author/M0srOXIZaHVieCtqejg3Nm9ISks3QT09\)](#), and [Ildar Rakipov \(https://sciprofiles.com/profile/181288\)](#) and [Iryna Kravchenko \(https://sciprofiles.com/profile/181289\)](#)

*Molbank* 2017, 2017(3); ; <https://doi.org/10.3390/M956> (<https://doi.org/10.3390/M956>) - 22 Aug 2017

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**Abstract** The title ester (1R,2S,5R)-2-isopropyl-5-methylcyclohexyl 4-aminobutyrate hydrochloride was obtained in 96% yield via Steglich esterification. The structure of the target compound was established by FTIR, HR-MS, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR spectral analysis, and single crystal X-ray diffraction study. [...] [Read more](#).

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#### (E)-3',6'-bis(Diethylamine)-2-[(2-methoxynaphthalen-1-yl)methyleneamino]spiro[isindoline-1,9'-xanthen]-3-one (1422-8599/2017/3/)

by [Pierce Perkins \(https://sciprofiles.com/profile/author/aUErbU5IY3djSHpLdXp5WWxWUllzVVR2dmRPK3FpWDXRVLJLV21jMIl4Zz0=\)](#), [Angela Winstead \(https://sciprofiles.com/profile/59265\)](#) and [Fasil Abebe \(https://sciprofiles.com/profile/300844\)](#)

*Molbank* 2017, 2017(3); ; <https://doi.org/10.3390/M955> (<https://doi.org/10.3390/M955>) - 18 Aug 2017

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The title compound, (E)-3',6'-bis(diethylamine)-2-[(2-methoxynaphthalen-1-yl)methyleneamino]spiro[isindoline-1,9'-xanthen]-3-one, was synthesized in 92% isolated yield using microwave-assisted organic synthesis. This new rhodamine derivative was fully characterized by <sup>1</sup>H-NMR, <sup>13</sup>C-NMR, FTIR and high resolution MS. [Full article \(1422-8599/2017/3/\)](#)

(This article belongs to the Section [Organic Synthesis \(journal/molbank/sections/organic\\_synthesis\\_molbank\)](#))

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(E)-2-(1-Cyano-2-methoxy-2-oxoethylidene)-3,4-dioxo-1-(pyridin-1-ium-1-yl)cyclobutan-1-ide ((1422-8599/2017/3/))

by [Johann Grünefeld](https://sciprofiles.com/profile/516725) (<https://sciprofiles.com/profile/516725>), [Conrad Kunick](https://sciprofiles.com/profile/15702) (<https://sciprofiles.com/profile/15702>) and [Peter G. Jones](https://sciprofiles.com/profile/author/a21wUEJnbUVTKzg2eDkzQVBoOEu4bnQySjk5dHpFWFVLTmdub0FhMEo5dz0=) (<https://sciprofiles.com/profile/author/a21wUEJnbUVTKzg2eDkzQVBoOEu4bnQySjk5dHpFWFVLTmdub0FhMEo5dz0=>), *Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M953> (<https://doi.org/10.3390/M953>) - 11 Aug 2017

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### Abstract

(E)-2-(1-Cyano-2-methoxy-2-oxoethylidene)-3,4-dioxo-1-(pyridin-1-ium-1-yl)cyclobutan-1-ide was obtained by a three-component reaction of squaric acid dichloride with pyridine and methyl cyanoacetate. [Full article \(\(1422-8599/2017/3/\)\)](https://doi.org/10.3390/M953)

(This article belongs to the Section [Organic Synthesis \(\(journal/molbank/sections/organic\\_synthesis\\_molbank\)\)](https://journal/molbank/sections/organic_synthesis_molbank))

Ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate ((1422-8599/2017/3/))

by [Hery Suwito](https://sciprofiles.com/profile/87893) (<https://sciprofiles.com/profile/87893>), [Salma Zulqaida](https://sciprofiles.com/profile/300968) (<https://sciprofiles.com/profile/300968>), [Kautsar UI Haq](https://sciprofiles.com/profile/author/Sm4zczVZdnVVKzZBNFZVekJIZHdBUjJ3Y2RhWEXiY1J0TVFiNEFYVXdySmI0NnZkSitzTr) (<https://sciprofiles.com/profile/author/Sm4zczVZdnVVKzZBNFZVekJIZHdBUjJ3Y2RhWEXiY1J0TVFiNEFYVXdySmI0NnZkSitzTr>),

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*Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M954> (<https://doi.org/10.3390/M954>) - 11 Aug 2017

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### Abstract

A one-pot multicomponent reaction has been used to synthesize the title compound, ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate by PTSA catalyzed Biginelli reaction. The chemical structure of the product was confirmed by spectroscopic evidence, FTIR, HRESI-MS, 1D-, and 2D NMR. [Full article \(\(1422-8599/2017/3/\)\)](https://doi.org/10.3390/M954)

(This article belongs to the Section [Organic Synthesis \(\(journal/molbank/sections/organic\\_synthesis\\_molbank\)\)](https://journal/molbank/sections/organic_synthesis_molbank))

Solvent-Mediated Synthesis of M(II)-Coordination Polymer Part 1: Crystal Structure of Poly(1,2-di(4-pyridyl)ethylene-*k*<sup>2</sup>*N,N'*-bis(1,4-benzenediacetato-*k*<sup>4</sup>*O,O',O",O"*)zinc(II)), C<sub>22</sub>H<sub>18</sub>ZnN<sub>2</sub>O<sub>4</sub> ((1422-8599/2017/3/))

by [Stephen Adie Adalikwu](https://sciprofiles.com/profile/299551) (<https://sciprofiles.com/profile/299551>),

[Offiong E. Offiong](https://sciprofiles.com/profile/author/dTVwWjhtTkNuejVQSDIkWxFd01LdG45R3hqNHgXOUJ0ci84c3RzanpkQT0=) (<https://sciprofiles.com/profile/author/dTVwWjhtTkNuejVQSDIkWxFd01LdG45R3hqNHgXOUJ0ci84c3RzanpkQT0=>) and

[Ayi A. Ayi](https://sciprofiles.com/profile/285948) (<https://sciprofiles.com/profile/285948>)

*Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M952> (<https://doi.org/10.3390/M952>) - 06 Aug 2017

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**Abstract** An interaction of water-methanol solution of sodium 1,4-benzenediacetate (bda) and 4,4'-bipyridylethelene (bpee) with aqueous solution of Zn(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O at room temperature yielded colourless crystals of **1** after three weeks in a sealed glass tube. The compound with composition C [...]

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Ethyl 5-(4-Bromophenyl)-4-methyl-1H-pyrrole-2-carboxylate ((1422-8599/2017/3/))

by [Marcus Baumann](https://sciprofiles.com/profile/79209) (<https://sciprofiles.com/profile/79209>) and [Ian R. Baxendale](https://sciprofiles.com/profile/111494) (<https://sciprofiles.com/profile/111494>)

*Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M951> (<https://doi.org/10.3390/M951>) - 04 Aug 2017

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**Abstract** This note describes a sequence converting an oxime-substituted pyrrolidine into a trisubstituted pyrrole structure. The synthetic route is based on a double chlorination of the pyrrolidine substrate followed by the base induced formation of both an imine and a nitrile oxide functionality. The [...] [Read more.](#)

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2-[(2,6-Dimethylmorpholin-4-yl)methyl]-4-[(E)-2-{3-[(E)-2-{3-[(2,6-dimethylmorpholin-4-yl)methyl]-4-hydroxy-5-methoxyphenyl}ethenyl]-1H-pyrazol-5-yl}ethenyl]-6-methoxyphenol ((1422-8599/2017/3/))

by [Joko Untung](https://sciprofiles.com/profile/301490) (<https://sciprofiles.com/profile/301490>),

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and [Hayun Hayun](https://sciprofiles.com/profile/24056) (<https://sciprofiles.com/profile/24056>)

*Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M949> (<https://doi.org/10.3390/M949>) - 03 Aug 2017

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**Ab** [MDPI](#) novel di-Mannich derivative of curcumin pyrazole, 2-[(2,6-dimethyl morpholin-4-yl)methyl]-4-[(E)-2-{3-[(E)-2-{3-[(2,6-dimethylmorpholin-4-yl)methyl]-4-hydroxy-5-methoxyphenyl}ethenyl]-1H-pyrazol-5-yl}ethenyl]-6-methoxyphenol (**2**), has been synthesized through a Mannich reaction of curcumin pyrazole (**1**), formaldehyde, and 2,6-dimethylmorpholine. The structure of the synthesized compound was confirmed on [\[...\] Read more](#). (This article belongs to the Section [Organic Synthesis \(/journal/molbank/sections/organic\\_synthesis\\_molbank\)](#))

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[\(OC-6-35-A\)-Aquadicarbonylchlorido\[2-\(2-pyridyl\)-1,8-naphthyridine-κ<sup>2</sup>N<sup>1</sup>,N<sup>2</sup>\]ruthenium\(II\) hexafluoridophosphate 2,2'-Bipyridine \(/1422-8599/2017/3/\)](#)

by [Tsubiko Takase \(https://sciprofiles.com/profile/298817\)](#),

[Ryosuke Abe \(https://sciprofiles.com/profile/author/VGM3VIRuYndGVCs4MEZzRk8reGRoZDdOVIV4ZDIqakdCZkdEK1FhZmNnZz0=\)](#) and

[Dai Oyama \(https://sciprofiles.com/profile/60056\)](#)

*Molbank* **2017**, *2017*(3), ; <https://doi.org/10.3390/M950> (<https://doi.org/10.3390/M950>) - 03 Aug 2017

Cited by [1 \(/1422-8599/2017/3/#citedby\)](#). | Viewed by 1046

**Abstract** A dicarbonylruthenium(II) complex containing bidentate 2-(2-pyridyl)-1,8-naphthyridine, as well as monodentate aqua and chlorido ligands, were isolated and characterized using spectroscopic techniques and single crystal X-ray diffraction. These data indicate that geometrical isomerization occurs during the substitution reaction involving a superacid. Density functional theory [\[...\] Read more](#).

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Open Access Communication

[Rac-2',3a,6,6,6',6'-Hexamethyl-3a,3b,6,7-tetra-hydrospiro-\[benzo\[2,3\]cyclopropa\[1,2-c\]pyrazole-1,1'-cyclo-hepta\[2,4\]diene\] \(/1422-8599/2017/3/\)](#)

by [Marcus Baumann \(https://sciprofiles.com/profile/79209\)](#),

[Sophie Lapraille \(https://sciprofiles.com/profile/author/aGtGV0tDekhKM2VTVi9qSDlIOE9vcEQ2dGM2QW9LVTNQZVpWSCtPSDdyWT0=\)](#) and

[Ian R. Baxendale \(https://sciprofiles.com/profile/111494\)](#)

*Molbank* **2017**, *2017*(3), ; <https://doi.org/10.3390/M948> (<https://doi.org/10.3390/M948>) - 01 Aug 2017

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**Abstract** This note describes a novel reaction cascade in which a tosylhydrazone derivative of eucarvone undergoes a non-classical dimerization process under basic conditions. The key step in this sequence is a dipolar cycloaddition between a diazo species and a transient cyclopropene. A proposed mechanism [\[...\] Read more](#).

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[1,2,3,4-Tetra-O-Acetyl-β-D-Mannuronic Acid \(/1422-8599/2017/3/\)](#)

by

[Laura Beswick \(https://sciprofiles.com/profile/author/aHBPRDisSFMyOWZWcVg0UVNNendHdHpsamN1UkhoVUIxSGo0RW5kakhWUT0=\)](#) and

[Gavin J. Miller \(https://sciprofiles.com/profile/290127\)](#)

*Molbank* **2017**, *2017*(3), ; <https://doi.org/10.3390/M947> (<https://doi.org/10.3390/M947>) - 14 Jul 2017

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**Abstract** 1,2,3,4-Tetra-O-acetyl-β-D-mannuronic acid was synthesized in three steps from commercial D-mannose in 21% yield. Regioselective 6-O-tritylation followed by per-acetylation and 6-OTr removal using HBr/AcOH gave the required primary alcohol substrate, which was then oxidised to the target [\[...\] Read more](#).

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[Ethyl 2-\[2-\(4-Nitrobenzoyl\)-1H-indol-3-yl\]acetate \(/1422-8599/2017/3/\)](#)

by

[Sunyoung Choi \(https://sciprofiles.com/profile/author/R2ZVOXZzdEIHT0p6WmdQUJR3MTRtZ3NNTHFPZGg2Wm5uSHR2SUZHTXlwQT0=\)](#) and

[Sung-Gon Kim \(https://sciprofiles.com/profile/204449\)](#)

*Molbank* **2017**, *2017*(3), ; <https://doi.org/10.3390/M945> (<https://doi.org/10.3390/M945>) - 12 Jul 2017

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**Abstract** Ethyl 2-[2-(4-nitrobenzoyl)-1H-indol-3-yl]acetate was prepared in good yield and characterized by the aza-alkylation/intramolecular Michael

cascade reaction of (E)-ethyl 3-[2-(tosylamino)phenyl]acrylate with 2-bromo-4"-nitroacetophenone, followed by desulfonative dehydrogenation with 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU) The structure of the newly synthesized compound was determined using <sup>1</sup>H-, [\[...\] Read more \(accept cookies\)](#)

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by **Hery Suwito** (<https://sciprofiles.com/profile/87893>),

**Lutfan Zulianto** (<https://sciprofiles.com/profile/author/dy9FVFhhdVUvRi9SVHBad1owYmtmOGxoVzZ4ZTV3TjZrTUoyNEhqT3NZOVJ6cXZFMTY>)

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*Molbank* 2017, 2017(3), ; <https://doi.org/10.3390/M946> (<https://doi.org/10.3390/M946>) - 11 Jul 2017

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**Abstract** A new compound belonging to the “heterostilbene” derivative, namely ethyl (*E*)-4-(2,4-dimethoxyphenyl)-6-(2,4-dimethoxystyryl)-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (**2**), has been successfully synthesized as an unprecedented side product of the Biginelli reaction between 2,4-dimethoxybenzaldehyde, ethyl acetoacetate and urea, employing PTSA as catalyst in reflux conditions and [...]. **Read more.**

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**Interests:** medicinal heterocyclic chemistry; pyridazines; carbazoles; nitrogen heteroarenes

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**Interests:** organic synthesis, methodology and spectroscopic analysis; heterocyclic chemistry; natural products; asymmetric synthesis; nitrogenated compounds of pharmaceutical interest; multicomponent reactions



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**Interests:** self-assembly; mechanically interlocked molecules (rotaxanes and catenanes); hydrogen bond; template synthesis; molecular recognition; supramolecular chemistry

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**Interests:** asymmetric synthesis methodology; free radical reactions; organometallic reagents; natural product synthesis; asymmetric catalysis



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**Interests:** new syntheses of high value added molecules through catalytic assembly of simple units; innovative syntheses of heterocyclic molecules of pharmaceutical, agrochemical, or applicative interest; carbonylation chemistry; use of non-conventional solvents in organic synthesis; synthesis and semi-synthesis of bioactive compounds of pharmaceutical or agrochemical interest; synthesis of new materials for advanced applications; extraction, characterization, and evaluation of the biological activity of bioactive principles from natural matrices

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**Interests:** heterocyclic chemistry; sulfur-nitrogen heterocycles; synthetic methods; azaacenes; zwitterionic acenes; stable organic radicals; biologically active heterocycles; isothiazoles; 1,2,3-dithiazoles; 1,2,6-thiadiazines; 1,2,4-benzotriazines

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**Interests:** organic synthesis and methodology; radical reactions; organocatalysis; asymmetric catalysis; photochemistry; aryne chemistry

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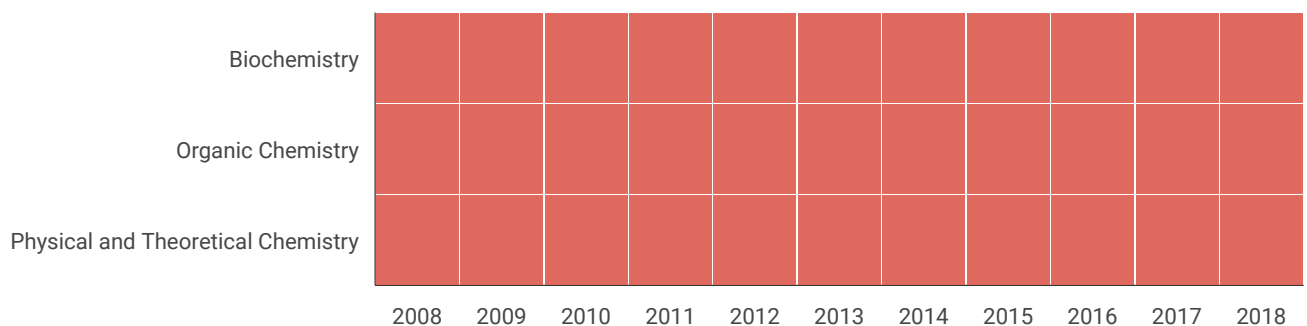
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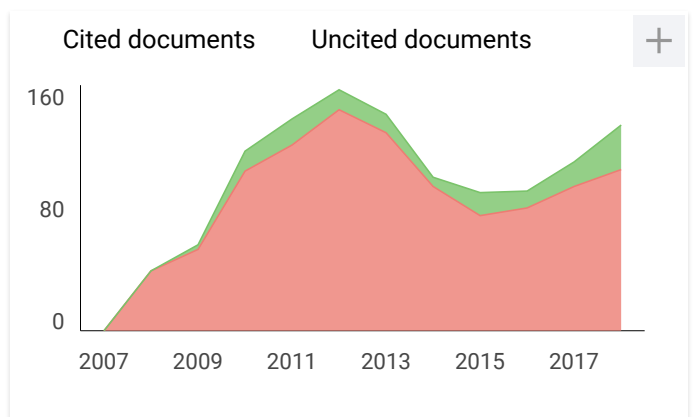
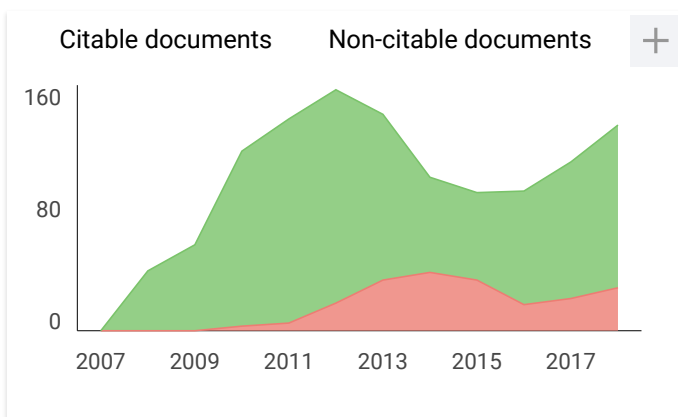
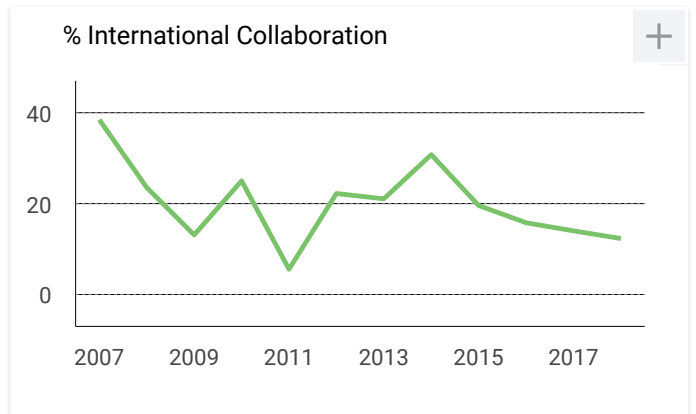
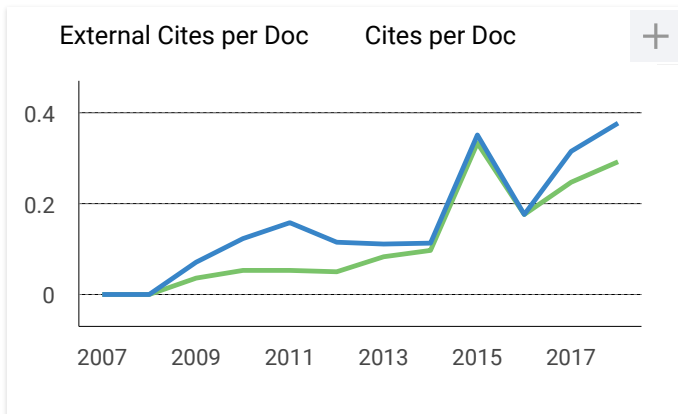
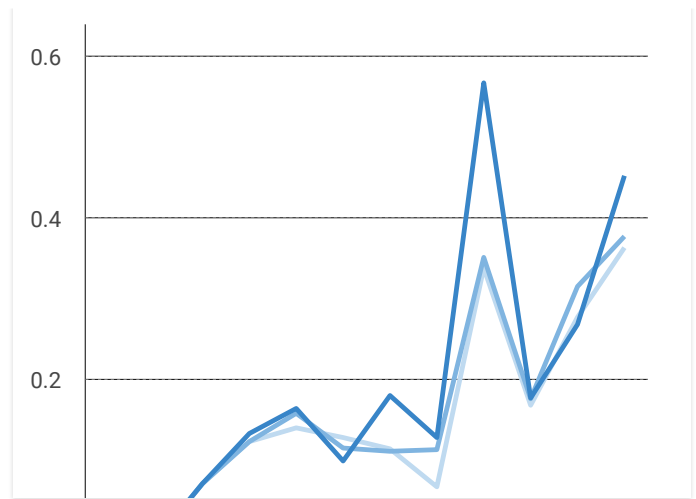
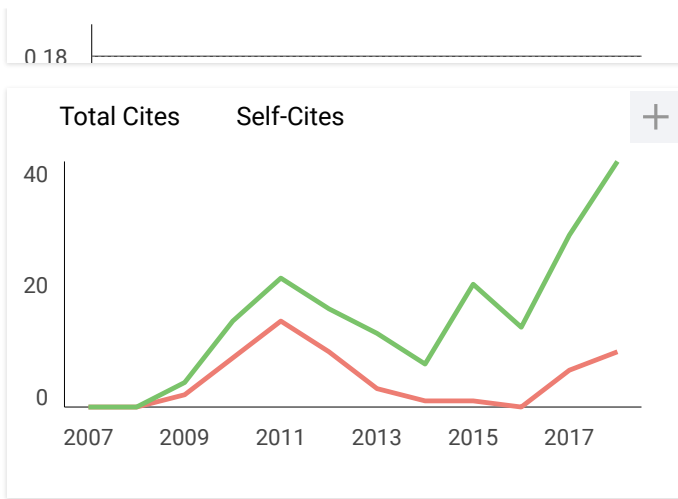
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Short Note

# Ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate

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**Abstract:** A one-pot multicomponent reaction has been used to synthesize the title compound, ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate by PTSA catalyzed Biginelli reaction. The chemical structure of the product was confirmed by spectroscopic evidence, FTIR, HRESI-MS, 1D-, and 2D NMR.

**Keywords:** one-pot multicomponent reaction; Biginelli reaction; furanyl DHPM

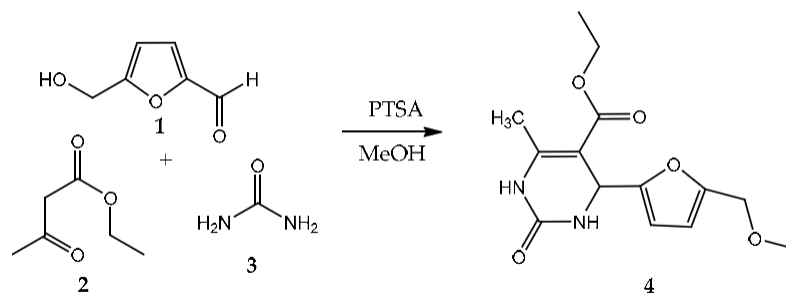
## 1. Introduction

Nitrogen containing heterocycles are widespread in many naturally occurring compounds. They build the core structures of many biologically active scaffolds as well as some industrial compounds. Among these, dihydropyrimidinone (DHPM) derivatives attract many researchers due to their simple synthesis protocol. The synthesis of DHPM was firstly reported by Italian chemist Pietro Biginelli in 1893 through simple one-pot multicomponent reaction of benzaldehyde, urea, and ethyl acetoacetate employing HCl as catalyst [1]. Furthermore, the attractiveness of DHPM derivatives are associated with their unique pharmacological activities such as antioxidant [2], anti-inflammation, antibacterial, antifungal [3], anti HIV [4], anticancer [5], and antihypertensive activities [6]. In continuation of our research for finding an anticancer agent acting as inhibitor of the mitotic kinesin Eg5, we have successfully synthesized a series of DHPM derivatives employing Biginelli reaction and herein we report a new DHPM derivative namely ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate (4).

## 2. Results and Discussion

The synthesis of the title compound (4) was conducted in one step reaction as presented in Scheme 1.

The synthesis of the title compound was performed by combining usual Biginelli procedure with methylation at hydroxyl methyl group of the furan ring as reported by Yoshida et al. [7]. The reaction was carried out in methanol in the presence of 0.025 mol % of PTSA as catalyst at room temperature. The usage of PTSA as a catalyst for Biginelli reaction was previously reported by Jin et al. [8] and Matache et al. [9]. Besides solvent, methanol was also acting as a methylation agent. The target molecule 4 was obtained as white solid in 40% yield with m.p of 178–180 °C. The structure of the compound 4 was established by FTIR, HRESI-MS, <sup>1</sup>H-, APT-, and 2D NMR spectral data.

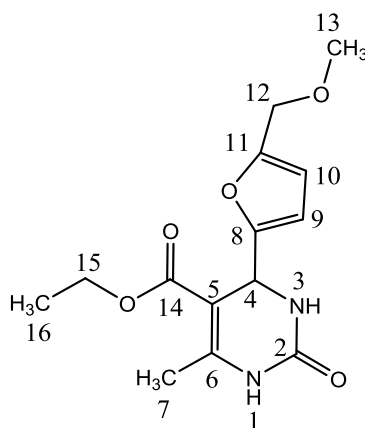


**Scheme 1.** Synthesis of ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydro pyrimidine-5-carboxylate (4).

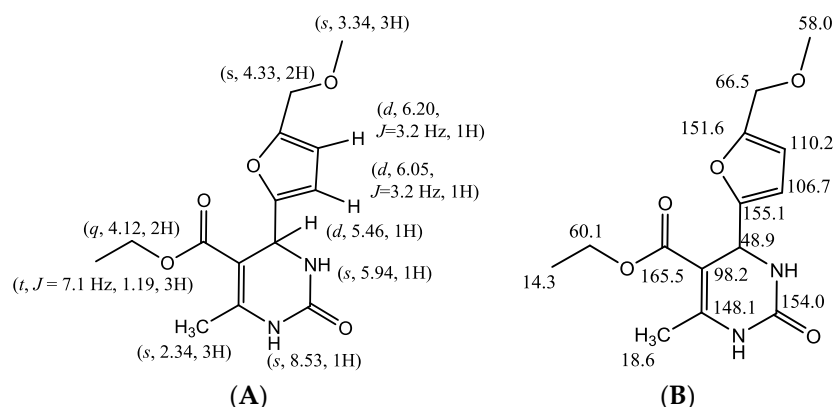
The HRESIMS displayed a negative molecular ion at  $m/z$  293.1145 indicating a molecular formula of  $C_{14}H_{18}N_2O_5$  and 8 degrees of unsaturation (see Supplementary Material Figure S1). The FTIR spectrum exhibited absorption bands at 3238, 1710, 1656  $cm^{-1}$  indicating the presence of an  $-NH$  amide group, carbonyl group of an ester, and an amide respectively [10] (see Supplementary Material, Figure S2).

To facilitate the discussion, we provide the numbering of the title compound as displayed in Figure 1, while the NMR chemical shifts is displayed in Figure 2. The existence of tetrahydropyrimidine ring is proven by the following data. Two broad single signals at 5.94 and 8.53 ppm of  $^1H$ -NMR spectrum indicated two amide protons (see Supplementary Material, Figure S3), while the carbonyl group is assigned by the  $^{13}C$  signal at 154.0 ppm (see Supplementary Material, Figure S4). The  $sp^2$  two carbon atoms were confirmed by two  $^{13}C$  signals at 98.2 and 148.1 ppm, whereas a signal at 48.9 ppm indicated a  $sp^3$  carbon atom which attaches a proton that appeared as a doublet signal at 5.46 ppm. A methyl group attached in a  $sp^2$  carbon atom was observed as a singlet signal at 2.34 ppm. This information indicated that the title compound possessing 6-methyl-4-aryl-3,4-dihydropyrimidin-2-on scaffold, typical skeleton of Biginelli product. The existence of the ethyl ester group was confirmed by a  $^{13}C$  signal at 165.5 ppm indicated a carbonyl ester, whereas the ethyl group was observed by  $^1H$  signal as a quartet at 4.12 ppm indicated an oxy-methylene ( $^{13}C$  signal was observed at 60.1 ppm), and the methyl group appeared as a triplet at 1.19 ppm ( $^{13}C$  signal was observed at 14.3 ppm) [11,12].

Furthermore, in the aromatic area, two signals— $\delta_H$  (ppm) 6.05 (d,  $J = 3.1$  Hz, 1H) and 6.20 (d,  $J = 3.1$  Hz, 1H)—were observed, indicating the presence of two protons in an ortho position of H-9 and H.10 in a furan ring. The oxy-methylene fragment appeared as a singlet signal at  $\delta_H$  4.33 ppm or at 66.5 ppm in the carbon signal. A methoxy fragment attached in an aliphatic carbon atom was demonstrated by a singlet signal at  $\delta_H$  3.34 ppm or at 58.0 ppm in the carbon signal. The APT spectra showed 14 signals representing all carbon atoms of the title compound.



**Figure 1.** Numbering of the title compound.

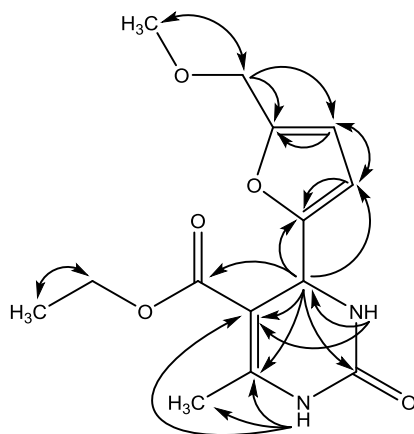


**Figure 2.**  $^1\text{H}$ - (A) and  $^{13}\text{C}$ - (B) NMR chemical shifts ( $\text{CDCl}_3$ ) of the title compound.

The existence of two NH protons was also confirmed by HMQC experiment which showed the existence of two proton signals exhibiting no correlation with carbon atoms (see Supplementary Material, Figure S5). Based on HMBC experiment (see Supplementary Material, Figure S6), the presence of 6-methyl-4-aryl-3,4-dihydropyrimidin-2-one scaffold possessing ester substituent at C-5 was convinced by a correlation of proton H-4 ( $\delta_{\text{H}}$  5.46 ppm) with olefinic carbon and  $\alpha,\beta$ -unsaturated carbonyl ester  $\delta_{\text{C}}$  (ppm) 98.2 (C-5), 148.1 (C-6), 165.5 (C-14) respectively, carbonyl urea-type ( $\delta_{\text{C}}$  154.0 ppm, C-2), and two carbon from the furan ring— $\delta_{\text{C}}$  (ppm) 155.1 (C-8) and 106.7 (C-9). The presence of this skeleton was also convinced by a long range correlation of NH proton  $\delta_{\text{H}}$  8.53 ppm (H-1) with two  $\alpha,\beta$ -unsaturated olefinic carbon atoms (C-5 and C-6) and methyl olefinic ( $\delta_{\text{C}}$  18.6 ppm, C-7). Furthermore, the presence of furan ring was convinced by two aromatic protons— $\delta_{\text{H}}$  (ppm) 6.05 (H-9) and 6.20 (H-10)—which correlated with its three neighboring carbon atoms— $\delta_{\text{C}}$  (ppm) 155.1 (C-8), 151.6 (C-11), and 110.2 (C-10) or 106.7 (C-9). In addition, the presence of methoxymethylene substituent at C-11 was convinced by a long range correlation between methylene proton  $\delta_{\text{H}}$  4.33 with two carbon of furan ring (C-10 and C-11) and methoxy carbon ( $\delta_{\text{C}}$  58 ppm, C-13). The selected long range correlation is suitable with the structure of the title compound is displayed in Figure 3. The structure refinement parameters is displayed in Table 1. Based on the structure elucidation of the obtained spectrum, the title compound is a new compound.

**Table 1.** NMR data of Ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate in  $\text{CDCl}_3$

No. Atom	$\delta_{\text{H}}$ (mult, J Hz)	$\delta_{\text{C}}$ (ppm)	HMBC
1	8.53 (s, 1H)	—	C-5, C-6, C-7, C-14
2		154.0	
3	5.94 (s, 1H)	—	C-4, C-5
4	5.46 (d, J = 3.0 Hz, 1H)	48.9	C-2, C-5, C-6, C-8, C-9, C-14
5		98.2	
6		148.1	
7	2.35 (s, 3H)	18.6	C-6, C-4, C-5, C-14
8		155.1	
9	6.05 (d, J = 3.2 Hz, 1H)	106.7	C-8, C-10, C-11
10	6.20 (d, J = 3.2 Hz, 1H)	110.2	C-9, C-8, C-11
11		151.6	
12	4.33 (s, 2H)	66.5	C-10, C-11, C-13
13	3.34 (s, 3H)	58.0	C-12
14		165.5	
15	4.12 (q, 2H)	60.1	C-16
16	1.19 (t, J = 7.1 Hz, 3H)	14.3	C-15



**Figure 3.** Selected HMBC correlation for compound 4.

### 3. Materials and Methods

The chemicals used in the research were provided from the commercial sources and pro analysis or pro synthesis grade. The melting point was measured with a Fisher–Johns melting point apparatus 220 VAC (Fisher Scientific, Waltham, MA, USA) and uncorrected. The reaction progress and purity of the product were monitored by thin layer chromatography on silica gel GF<sub>254</sub> plates (E Merck, Darmstadt, Germany) and the spots were identified by UV lamp ( $\lambda$  254 nm). The mass spectra was recorded by HRESI-MS (waters LCT premier XE, Waters Corp, Milford, MA, USA). FTIR spectra was recorded in KBr powder with the Diffuse Reflectance Method on spectrophotometer IRTracer100 (Shimadzu, Kyoto, Japan). NMR spectra (<sup>1</sup>H, APT, HMBC, and HMQC) were recorded on JEOL 400 ECA spectrometer (JEOL, Tokyo, Japan) using CDCl<sub>3</sub> as a solvent and internal standard.

#### *Synthesis Procedure of the Title Compound*

The mixture of 2 mmol 5-hydroxymethyl furfural, 3 mmol urea, 3 mmol ethyl acetoacetate, 0.5 mmol PTSA, and 5 mL methanol was stirred for 24 h at room temperature, the reaction progress was monitored by TLC on a silica gel plate employing chloroform:ethyl acetate (1:2) as a mobile phase. After the reaction was completed, the reaction mixture was then subjected to silica gel column chromatography using chloroform:ethyl acetate (1:2) as eluent to yield 40% of title compound.

### 4. Conclusion

One-pot multicomponent Biginelli reaction was employed to conduct the synthesis of a new compound ethyl 4-[5-(methoxymethyl)furan-2-yl]-6-methyl-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxylate.

**Supplementary Materials:** The following are available on line at [www.mdpi.com/1422-8599/2017/3/M954](http://www.mdpi.com/1422-8599/2017/3/M954), HRESIMS, FTIR, <sup>1</sup>H-, NMR, APT, HMQC, and HMBC spectra of the title compound are reported in the supplementary materials as Figures S1–S6 and structure refinement parameters as Table 1.

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**Author Contributions:** H.S. brought out the idea, managed the research, and wrote the article. S.Z. carried out the synthesis, K.U.H. analyzed the spectra. I.I. elucidated the spectral data. A.N.K. elucidated the spectral data and corrected the draft. All the authors have read the draft.

**Conflicts of Interest:** The authors declare no conflict of interest.

### References

1. Biginelli, P. Derivati Aldeiduredici Degli Eteri Acetile Dossal-Acetico. *Gazz. Chim. Ital.* **1893**, *23*, 360–413.

- De Vasconcelos, A.; Oliveira, P.S.; Ritter, M.; Freitag, A.; Romano, L.; Quina, F.H.; Pizzuti, L.; Pereira, C.M.P.; Stefanello, F.M.; Barschak, A.G. Antioxidant capacity and environmentally friendly synthesis of dihydropyrimidin-(2H)-ones promoted by naturally occurring organic acids. *J. Biochem. Mol. Toxicol.* **2012**, *26*, 155–161. [[CrossRef](#)] [[PubMed](#)]
- Bhatewara, A.; Jetli, S.R.; Kadre, T.; Paliwal, P.; dan Jain, S. Microwave-assisted synthesis and biological evaluation of dihydropyrimidinone derivatives as anti-inflammatory, antibacterial, and antifungal agents. *Int. J. Med. Chem.* **2013**, *2013*, 1–5. [[CrossRef](#)] [[PubMed](#)]
- Kim, J.; Park, C.; Ok, T.; So, W.; Jo, M.; Seo, M.; Kim, Y.; Sohn, J.H.; Park, Y.; Ju, M.K.; et al. Discovery of 3,4-dihydropyrimidin-2(1H)-ones with inhibitory activity against HIV-1 replication. *Bioorg. Med. Chem. Lett.* **2012**, *22*, 2119–2124. [[CrossRef](#)] [[PubMed](#)]
- Sośnicki, J.G.; Struk, Ł.; Kurzawski, M.; Perużyńska, M.; Maciejewska, G.; dan Drożdżik, M. Regioselective synthesis of novel 4,5-diaryl functionalized 3,4-dihydropyrimidine-2(1H)-thiones via a non-biginelli-type approach and evaluation of their in vitro anticancer activity. *Org. Biomol. Chem.* **2014**, *12*, 3427–3440. [[CrossRef](#)] [[PubMed](#)]
- Nagarajaiah, H.; Mukhopadhyay, A.; dan Moorthy, J.N. Biginelli reaction: An overview. *Tetrahedron Lett.* **2016**, *57*, 5135–5149. [[CrossRef](#)]
- Yoshida, N.; Kasuya, N.; Haga, N.; Fukuda, K. Brand-new biomass-based vinyl polymers from 5-hydroxymethylfurfural. *Polym. J.* **2008**, *40*, 1164–1169. [[CrossRef](#)]
- Jin, T.; Zhang, S.; Li, T. p-Toluenesulfonic Acid-catalyzed efficient synthesis of dihydropyrimidines: Improved high yielding protocol for the biginelli reaction. *Synth. Commun.* **2002**, *32*, 1847–1851. [[CrossRef](#)]
- Matache, M.; Dobrota, C.; Bogdan, N.D.; Dumitru, I.; Ruta, L.L.; Paraschivescu, C.C.; Farcasanu, I.C.; Baciui, I.; Funeriu, D.P. Synthesis of fused dihydro-pyrimido [4, 3-d] coumarins using Biginelli multicomponent reaction as key step. *Tetrahedron* **2009**, *65*, 5949–5957. [[CrossRef](#)]
- Pretsch, E.; Bühlmann, P.; Badertscher, M. *Structure Determination of Organic Compounds, Tables of Spectral Data*, 4th Completely Revised ed.; Springer: Berlin, Germany, 2009; pp. 70, 134, 138.
- Pavia, D.L.; Lampman, G.M.; Kriz, G.S.; Vyvyan, J.R. *Introduction to Spectroscopy*, 4th ed.; Brooks/Cole, Cengage Learning: Belmont, CA, USA, 2009; pp. 151, 178, 293.
- Breitmaier, E. *Structure Elucidation by NMR in Organic Chemistry: A Practical Guide*, 3th Revised ed.; John Wiley & Sons, Ltd.: West Sussex, UK, 2002; pp. 11–12.



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