

1. 受賞

入江 正浩	Theodor-Förster Preis 2008 (GDCh and Deutsche Bunsen-Gesellschaft, Germany) 2008年10月
	Karl Friedrich Bonhoeffer Medal (Max-Planck-Institute, Germany) 2008年10月
山中 正浩	Molecular Chirality ASIA 2012 ポスター賞 (海津溪介) 2012年5月
大山 秀子	プラスチック成形加工学会秋季大会成形加工シンポジア'11 ベストポスター賞 (奈良沙織) 2011年11月

2. 新聞・メディア報道等

2-1. 新聞報道

望月 祐志	日経産業新聞	スパコンで創薬 「量子化学で作用計算」	2010/8/11
	日本経済新聞	新薬設計の精度5倍 立教大など 薬効、素早く判断	2011/6/20
	日経産業新聞	スパコンで創薬設計 効果素早く判断 開発期間を短縮	2011/6/21
	日経産業新聞	ITが導く医の進化論 スパコン創薬「京」 の号砲	2011/9/13
	日刊工業新聞	たんぱく質・医薬候補物質の相性 高速・ 高精度に解析	2012/3/27
	化学工業日報	官能基の相互作用解析 創薬支援の新手 法 立教大など	2012/3/27
常盤 広明	薬事日報	酵素は何をしているのか? 新世紀の科 学が解き明かす分子メカニズム	2012/3/21
入江 正浩	朝日新聞 (夕刊)	皇居で「講書始の儀」	2009/1/9
	日本経済新聞 (夕刊)	皇居で「講書始の儀」	2009/1/9
	読売新聞 (夕刊)	皇居で「講書始の儀」	2009/1/9
	東京新聞 (夕刊)	皇居で両陛下「講書始の儀」	2009/1/9
	毎日新聞 (夕刊)	「講書始の儀」を益川さんが傍聴	2009/1/9
	産経新聞	「講書始の儀」益川教授も傍聴	2009/1/10

2-2. テレビ放映・情報雑誌・ネットメディア

入江 正浩	NHK ニュース	講書始 両陛下に研究者が講義	2009/1/9
	MSN 産経ニュース	皇居で「講書始の儀」益川教授も傍聴	2009/1/9
	Chem-Station	光で形を変える結晶	2009/7/8
	RSC Chemistry World	Weightlifting Crystals	2010/9/30
	PHYSORG.COM	Crystal cantilever lifts objects 600 times its own weight	2010/10/1
	Chem-Station	結晶世界のウェイトリフティング	2010/12/11
	Wiley Chemistry Views	Bow Down to the Light	2011/11/21
	ワイリーサイエンスカフェ	光駆動アクチュエーター	2011/11/22
	Photonics Spectra	Light-triggered robotic arm bends, stretches	2012/2
	JACS Select #14	Advances at the Frontiers of Photochemical Sciences	2012/5/23

3. 学術雑誌の表紙掲載・重要論文

望月 祐志	Chem. Phys. Lett.誌：表紙	2010/4
山高 博	Faraday Discuss.誌：表紙	2010/4
入江 正浩	Bull. Chem. Soc. Jpn.誌：表紙	2008/8
	Photochem. Photobiol. Sci 誌：表紙	2010/8
	J. Am. Chem. Soc. 2010, <u>132</u> , 14172: JACS Select #14 (Advances at the Frontiers of Photochemical Sciences)	2012/5
	J. Am. Chem. Soc. 2011, <u>133</u> , 2621: JACS Select #14 (Advances at the Frontiers of Photochemical Sciences)	2012/5
	Angew. Chem. Int. Ed.誌：中表紙	2012/1
	Angew. Chem. Int. Ed. 2012, <u>51</u> , 901: Hot Paper	2012/1
山中 正浩	J. Org. Chem. 2009, <u>74</u> , 3266: Featured Article	2009/5
大山 秀子	Polymer J. 2011, <u>43</u> , 991: Highlight Paper	2011/12
和田 亨	Dalton Trans. 2011, <u>40</u> , 2225: Invited paper	

4. シンポジウム等の主催

常盤 広明	日本薬学会第 131 大会シンポジウム主催「新世紀の創薬を支える現代化学とマルチスケールシミュレーション」	2011/3
松下 信之	第 60 回錯体化学討論会シンポジウム主催「クロモトロピック金属錯体の最前線」	2010/9



【東京】... 講演会の様子
... 講演者... 聴衆...



【講演開始の儀】
... 講演者... 聴衆... 会場...



【講演開始の儀】
... 講演者... 聴衆... 会場...

日経産業新聞 2011/6/21



日経産業新聞 2010/8/11



日経産業新聞 2011/9/13



日本経済新聞 2011/6/20



たんぱく質・医薬候補物質の相性

高速・高精度に解析

美大生研など

京都大学大学院理学研究科の藤田 隆太准教授らの研究グループは、タンパク質と医薬候補物質の相性を高速・高精度に解析する手法を開発した。この手法は、タンパク質と医薬候補物質の相互作用を、従来の手法よりも100倍以上高速に解析できる。また、従来の手法よりも100倍以上高精度に解析できる。この手法は、タンパク質と医薬候補物質の相互作用を、従来の手法よりも100倍以上高速に解析できる。また、従来の手法よりも100倍以上高精度に解析できる。

官能基の相互作用解析

医薬候補化合物 創薬支援の手法

立教大など

立教大学大学院薬学部の藤田 隆太准教授らの研究グループは、官能基の相互作用を解析する手法を開発した。この手法は、官能基と官能基の相互作用を、従来の手法よりも100倍以上高速に解析できる。また、従来の手法よりも100倍以上高精度に解析できる。この手法は、官能基と官能基の相互作用を、従来の手法よりも100倍以上高速に解析できる。また、従来の手法よりも100倍以上高精度に解析できる。

酵素は何をしているのか?

新世紀の科学が解き明かす

分子メカニズム

常盤 広明 北垣 和夫

酵素は、生体内でさまざまな化学反応を促進する。その働きを解き明かすことが、新世紀の科学の重要な課題の一つである。常盤 広明、北垣 和夫のチームは、酵素の働きを分子メカニズムレベルで解析する手法を開発した。この手法は、酵素の働きを、従来の手法よりも100倍以上高速に解析できる。また、従来の手法よりも100倍以上高精度に解析できる。

テレビ放映・情報雑誌・ネットメディア (2-2)

NHK ニュース 2009/1/9



天皇皇后両陛下が研究者に講演

MSN 産経ニュース 2009/1/9

皇座で「讀書始の儀」 益川教授も傍聴

皇太子さまの皇族方も傍聴された。ノーベル物理学賞を受賞した益川龍英京都産業大学教授(68)も講演を傍聴した。

天皇皇后両陛下が年の初めにさまざまな分野の研究から講演を受けられる「讀書始」が皇座で行われました。

「讀書始」は午前10時半から皇座・宮殿の「松の間」で行われ、両陛下は、皇族方やノーベル物理学賞を受賞した益川龍英さんなど学術関係者とともに講演を受けられました。はじめに、京都大学の吉川忠夫名誉教授が、1世紀半ばに中国に伝来したとされる仏教が500年ほどかけて中国国内で定着していくまでの過程などについて説明しました。経営学が専門の東京理科大学の伊丹敬之教授は、経済が厳しい状況に追い込まれているなか、日本を奮めた世界の企業の望ましいあり方について説明しました。立教大学理学部の入江正志教授は「光に反応する分子」というテーマで講演を行い、光が当たると色や形を変える化学物質について解説しました。3人の研究者の講演はおよそ45分におたって行われ、両陛下は熱心に耳を傾けられました。

PHYSORG.COM 2010/10/1



Crystal cantilever lifts objects 600 times its own weight (w/ Video)

Under an UV laser beam, a cantilever beam...

When the crystal cantilever is irradiated with UV light from the right, it bends away from the light, and then returns to its original shape upon visible light irradiation. (Right) When the crystal cantilever is illuminated with UV light from below, it bends upward to lift a 2.5 mm lead ball weighing 45.77 mg. The crystal cantilever weighs 0.17 mg. Image credit: Matsuoka and Ito, 2010, American Chemical Society.

For a long time, scientists have been trying to translate the collective movements of they molecules into useful mechanical work. With this goal in mind, a team of researchers from Japan has developed a crystal cantilever that exhibits reversible bending upon alternate irradiation with ultraviolet (UV) and visible light. They've demonstrated that the crystal cantilever can lift metal balls that weigh up to 600 times more than the cantilever itself. In this process, the crystal's photochemical molecular-scale shape change generates a very large amount of stress - more than 100 times larger than the stress produced by biological muscles - to induce the macroscopic movement.

Matsuoka, Matsuoka and Matsuoka are from Rikkyo University of Tokyo, Japan, and the Japan Science and Technology Agency. They published their study on the crystals in a recent issue of the journal of the American Chemical Society.



Chem-Station 2009/7/8

化学者のつぶやき

Springer Materials



RSC Chemistry World 2010/9/30

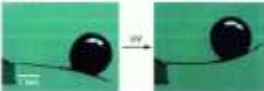
Weightlifting crystals

10 September 2010

Japanese researchers have created a crystal that reversibly bends like human muscle when irradiated with UV and visible light. The cantilever can lift metal balls up to 600 times its own weight and returns to its original shape when irradiated with visible light.

In 2010, Japanese researchers from Rikkyo University in Tokyo, Japan, and the Japan Science and Technology Agency (JST) demonstrated that a crystal cantilever can lift metal balls that weigh up to 600 times more than the cantilever itself. The crystal's photochemical molecular-scale shape change generates a very large amount of stress - more than 100 times larger than the stress produced by biological muscles - to induce the macroscopic movement.

The team made the crystal cantilever by depositing a thin layer of photochromic molecules on a silicon cantilever. When irradiated with UV light, the molecules change shape and generate a large amount of stress, causing the cantilever to bend. When irradiated with visible light, the molecules return to their original shape and the cantilever returns to its original position.



Chem-Station 2010/12/11

化学者のつぶやき

Springer Materials



Bow Down to the Light

Author: Angewandte Chemie International Edition
Published Date: 21/11/2011
Source / Publisher: Angewandte Chemie International Edition/Wiley-VCH
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Photonics Spectra

As instrumentation progresses, microbots and nanomechanics have moved beyond the realm of pure speculation. This technology requires tiny components. Full can respond to stimulation by undergoing controlled movements. Photochemical motion can be used to create a bending motion when subjected to an acidic fluid. Increase the volume required and a laser to microbots applications or those in liquid. In the journal Angewandte Chemie, a research team led by Masahito Iino at WRIKO University, Tokyo, Japan, has now introduced a sub-micron microbots that can be triggered to bend and contract by light.

The tiny robotic arms are made of a polymer shaped like micro- or millimeter-sized fish tails. When they are irradiated with UV light (365 nm), the rods bend toward the light source, when irradiated with visible light (480 nm) they stretch back into their original straight shape.

Why does the bending occur? The molecules in the crystals are an organic-inorganic system containing five rings. The central aromatic unit is a bicyclic group. UV light induces rearrangement of the chemical bonds (isomerization) and causes a ring closure within the molecule. This results in the shape change of each molecule, which leads to a geometry change of the crystal. The crystal contracts, but only when it is exposed to the UV light, that is, on the outer face of the irradiated side of the rod. This causes bending similar to that of a flexible arm. Visible light engages the reverse reaction, the newly formed single ring opens, the original crystal structure is restored, and the crystal straightens out.

Photonics Spectra article page with text and diagrams. Title: Light-triggered robotic arm bends, stretches. Includes a 3x3 grid of images showing the bending process.

ワイリーサイエンスカフェ 2011/11/22

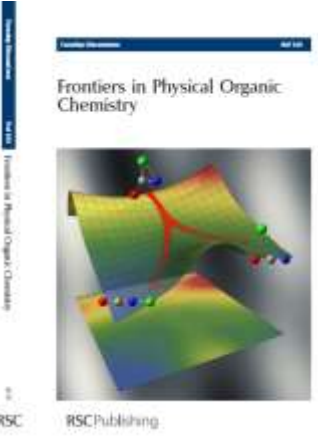
Wiley Science Cafe event page. Includes title '光駆動アクチュエーター - 立巻大-入江正彦特任教授からのACI研究成果をChemistry Viewsで紹介' and a small image of the microbot.

学術雑誌の表紙・重要論文 (3)

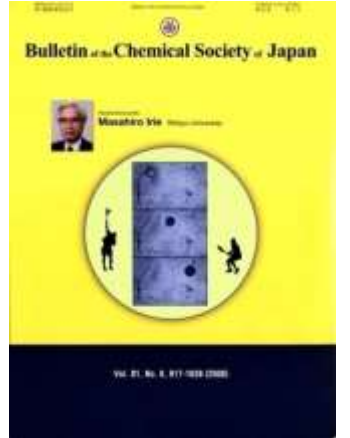
Chem. Phys. Lett. 2010/4



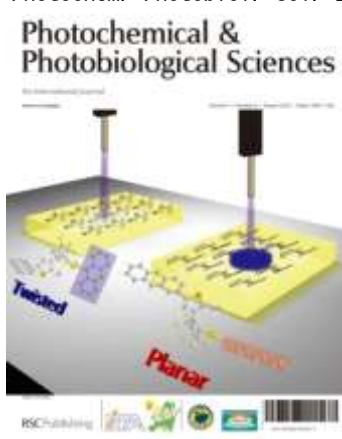
Faraday Discuss. 2010/4



Bull. Chem. Soc. Jpn. 2008/8



Photochem. Photobiol. Sci. 2010/8



Angew. Chem. Int. Ed. 2012/1



J. Am. Chem. Soc.
2010, **132**, 14172

JACS
ARTICLES

A Diarylethene-Crosslinker That Converts Light Into Mechanical Work

Yoshitaka Maruyama^{1,2} and Naoya Terai¹

¹Department of Chemistry and Research Center for Chemical Processes, Osaka University, Suita, Osaka 565-0871, Japan; ²RIKEN Saitama Institute, 1-1-1 Hirosawa, Saitama 358-8501, Japan

ABSTRACT: The photochromic effect of a crosslinker plays an important role in the construction of photochromic materials. A crosslinker that undergoes a reversible photochromic reaction and photochromic crosslinking (PCCL) has been developed. The crosslinker is composed of a diarylethene derivative and a crosslinker group. The PCCL reaction of the crosslinker leads to a reversible photochromic crosslinking reaction. The PCCL reaction of the crosslinker leads to a reversible photochromic crosslinking reaction. The PCCL reaction of the crosslinker leads to a reversible photochromic crosslinking reaction.

J. Am. Chem. Soc.
2011, **133**, 2621

JACS

One-Color Reversible Control of Photochromic Reactions in a Diarylethene-Derivative Three-Photon Cyclization and Two-Photon Cycloaddition by a Near-Infrared Femtosecond Laser Pulse at 1.28 µm

Katsuya Mori,¹ Yoshitaka Maruyama,¹ Yusaku Inaba,¹ Takashi Ishiguro,¹ Naoya Terai,¹ and Naoya Terai¹

¹Department of Chemistry, Faculty of Science, Osaka University, Suita, Osaka 565-0871, Japan; ²RIKEN Saitama Institute, 1-1-1 Hirosawa, Saitama 358-8501, Japan

ABSTRACT: A near-infrared femtosecond laser pulse at 1.28 µm can induce both three-photon cyclization and two-photon cycloaddition of a diarylethene derivative in a one-color reversible manner. The photochromic reaction of the diarylethene derivative is controlled by the laser pulse at 1.28 µm. The photochromic reaction of the diarylethene derivative is controlled by the laser pulse at 1.28 µm.

Angew. Chem. Int. Ed.
2012, **51**, 901

Light-Driven Molecular-Crystal Anisotropic Rapid and Reversible Heating of Rodlike Mixed Crystals of Diarylethene Derivatives[†]

Yoshitaka Maruyama, Naoya Terai, and Naoya Terai

ABSTRACT: Light-driven molecular-crystal anisotropic heating of rodlike mixed crystals of diarylethene derivatives is reported. The heating is induced by the light-driven photochromic reaction of the diarylethene derivative. The heating is induced by the light-driven photochromic reaction of the diarylethene derivative.



ABSTRACT: The photochromic reaction of a diarylethene derivative is reported. The heating is induced by the light-driven photochromic reaction of the diarylethene derivative. The heating is induced by the light-driven photochromic reaction of the diarylethene derivative.

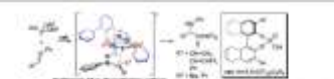
J. Org. Chem.
2009, **74**, 3266

JOC Featured Article

HFT Study on Difunctional Chiral Binomial Acid-Catalyzed Asymmetric Hydrophosphorylation of Imines

Yoshitaka Maruyama¹ and Naoya Terai¹

¹Department of Chemistry, Faculty of Science, Osaka University, Suita, Osaka 565-0871, Japan



ABSTRACT: A new difunctional chiral binomial acid-catalyzed asymmetric hydrophosphorylation of imines is reported. The reaction is catalyzed by a difunctional chiral binomial acid. The reaction is catalyzed by a difunctional chiral binomial acid.

Polymer J.
2011, **43**, 991

High performance reactive blends composed of poly(p-phenylene sulfide) and ethylene copolymers

Yoshitaka Maruyama, Naoya Terai, and Naoya Terai

ABSTRACT: A high performance reactive blend is reported. The blend is composed of poly(p-phenylene sulfide) and ethylene copolymers. The blend is composed of poly(p-phenylene sulfide) and ethylene copolymers.

ABSTRACT: A high performance reactive blend is reported. The blend is composed of poly(p-phenylene sulfide) and ethylene copolymers. The blend is composed of poly(p-phenylene sulfide) and ethylene copolymers.

Dalton Trans.
2011, **40**, 2225

Substituent dependent capability of bis(anthracene-diolone-coordinating) complexes toward water oxidation[†]

Yoshitaka Maruyama, Naoya Terai, and Naoya Terai

ABSTRACT: A study on the capability of bis(anthracene-diolone-coordinating) complexes toward water oxidation is reported. The study is on the capability of bis(anthracene-diolone-coordinating) complexes toward water oxidation.

ABSTRACT: A study on the capability of bis(anthracene-diolone-coordinating) complexes toward water oxidation is reported. The study is on the capability of bis(anthracene-diolone-coordinating) complexes toward water oxidation.