Time-resolved structures of β2-adrenergic receptor modulation by 2 a photoswitchable beta-blocker

Robin Stipp, Quentin Bertrand, Matilde Trabuco, Anna Duran-Corbera, Maria Tindara Ignazzitto, Hannah Glover, Fabienne Stierli, Juanlo Catena, Melissa Carrillo, Sina Hartmann, Hans-Peter Seidel, Matthias Mulder, Thomas Mason, Yasushi Kondo, Maximillian Wranik, Martin Appleby, Christoph Sager, Raymond Sierra, Gregory Gate, Pamela Schleissner, Xinxin Cheng, Tobias Weinert, Robert Cheng, Sandra Mous, John H. Beale, Michal Kepa, Amadeu Llebaria, Michael Hennig, Xavier Rovira, Joerg Standfuss BioRxiv 2025 Sep. doi: https://doi.org/10.1101/2025.09.03.673938

BioRxiv 2025 Sep. doi: https://doi.org/10.1101/2025.09.03.673938

- ultraviolet light
- photopharmacology
- Optical switching molecules
- β2 adrenergic receptor

A photoswitchable positive allosteric modulator to control the activation of the metabotropic glutamate receptor 5 by light

Anaëlle Dumazer, Roser Borras-Tuduri, Iona Truong, Xiaojing Cong, Fanny Malhaire, Xavier Rovira, Xavier Gomez-Santacana, Laurent Givalois, Guillaume Lebon, Amadeu Llebaria, Cyril Goudet

Biochem Pharmacol. 2025 Jun 24:240:117065. doi: 10.1016/j.bcp.2025.117065.

- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules
- Metabotropic glutamate receptors

Exploring the Mucin Glycan-Degrading Glycoside Hydrolase Landscape in the Gut Microbiome and Targeting HSP90 in Microbial Pathogens

Mark Edward Kowalewski

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- Near-infrared light
- photopharmacology
- Heat shock protein
- Gut microbiome

Photoresponsive Adenosine Derivatives for the Optical Control of Adenosine A2A Receptors in Living Cells

Harufumi Suzuki, Tomohiro Doura, Yuya Matsuba, Yuma Matsuoka, Tsuyoshi Araya, Hidetsugu Asada, So Iwata, Shigeki Kiyonaka

ACS Chem Biol. 2024 Dec 20;19(12):2494-2501. doi: 10.1021/acschembio.4c00583.

- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules

- Adenosine A2A receptor

Light-Controlled Anticancer Activity and Cellular Uptake of a Photoswitchable Cisplatin Analogue

Marta Stolarek, Kamil Kaminski, Marta Kaczor-Kamińska, Magdalena Obłoza, Piotr Bonarek, Anna Czaja, Magdalena Datta, Wojciech Łach, Mateusz Brela, Artur Sikorski, Janusz Rak, Maria Nowakowska, Krzysztof Szczubiałka

J Med Chem . 2024 Nov 14;67(21):19103-19120. doi: 10.1021/acs.jmedchem.4c01575.

- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules
- cancer

Assays to measure small molecule Hsp70 agonist activity in vitro and in vivo

Olivia Shapiro, Clara Woods, Amanda M. Gleixner, Sara Sannino, Marilyn Ngo, Michael D. McDaniels, Peter Wipf, Neil A. Hukriede, Christopher J. Donnelly, Jeffrey L. Brodsky

Anal Biochem. 2024 Nov 9:697:115712. doi: 10.1016/j.ab.2024.115712.

- blue light
- photopharmacology
- Heat shock protein
- Protein homeostasis

Photoswitchable positive allosteric modulators of metabotropic glutamate receptor 4 to improve selectivity

Silvia Panarello, Aleix González-Díez, Alice E. Berizzi, Fanny Malhaire Roser Borràs-Tudurí Xavier Rovira Carme Serra Laurent Prézeau Jean-Philippe Pin Cyril Goudet Amadeu Llebaria Xavier Gómez-Santacana

iScience. 2024 May 28. https://doi.org/10.1016/j.bcp.2024.116396

- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules
- Metabotropic glutamate receptors

A high-affinity, cis-on photoswitchable beta blocker to optically control β2-adrenergic receptors in vitro and in vivo

Shuang Shi, Yang Zheng, Joëlle Goulding, Silvia Marri, Laura Lucarini, Benjamin Konecny, Silvia Sgambellone, Serafina Villano, Reggie Bosma, Maikel Wijtmans, Stephen J. Briddon, Barbara A. Zarzycka, Henry F. Vischer, Rob Leurs

Biochem. Pharmacol. 2024 June 26. https://doi.org/10.1016/j.isci.2024.110123

- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules

- β2 adrenergic receptor

Targeting Borrelia burgdorferi HtpG with a berserker molecule, a strategy for anti-microbial development

Dave L Carlson, Mark Kowalewski, Khaldon Bodoor, Adam D Lietzan, Philip F Hughes, David Gooden, David R Loiselle, David Alcorta, Zoey Dingman, Elizabeth A Mueller, Irnov Irnov, Shannon Modla, Tim Chaya, Jeffrey Caplan, Monica Embers, Jennifer C Miller, Christine Jacobs-Wagner, Matthew R Redinbo, Neil Spector, Timothy AJ Haystead

Cell Chem Biol. 2024 Mar 21;31(3):465-476.e12. doi: 10.1016/j.chembiol.2023.10.004.

- Red light
- photopharmacology
- Photodynamic therapy (PDT)
- Berteporfin
- Antibiotics
- Antimicrobial photodynamic therapy (a-PDT)
- Spirochete
- Lyme disease

Crystal structure reveals the binding mode and selectivity of a photoswitchable ligand for the adenosine A2A receptor

Tsuyoshi Araya, Yuya Matsuba, Harufumi Suzuki, Tomohiro Doura, Nipawan Nuemket, Eriko Nango, Masaki Yamamoto, Dohyun Im, Hidetsugu Asada, Shigeki Kiyonaka, So Iwata

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- ultraviolet light
- blue light
- photopharmacology
- Optical switching molecules
- Adenosine A2A receptor

Optogluram-2: a subtype-selective photoswitchable positive allosteric modulator for metabotropic glutamate receptor 4

Silvia Panarello, Aleix González-Díez, Alice Berizzi, Fanny Malhaire, Roser Borràs-Tudurí, Xavier Rovira, Laurent Prezeau, Jean-Philippe Pin, Cyril Goudet, Amadeu Llebaria, Xavier Gómez-Santacana

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- ultraviolet light
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- Metabotropic glutamate receptors

Visible-Light-Controlled Histone Deacetylase Inhibitors for Targeted Cancer Therapy

Laia Josa-Culleré, Amadeu Llebaria

J Med Chem. 2023 Jan 18. doi: 10.1021/acs.jmedchem.2c01713

- ultraviolet light
- Green light
- photopharmacology
- Optical switching molecules
- cancer

Targeting Borrelia Burgdorferi HtpG with a Berserker Molecule, A Novel Paradigm for Anti-Microbial Development

David Carlson et al.

SSRN 2023

- Red light
- photopharmacology
- Photodynamic therapy (PDT)
- Reactive oxygen species
- Antibiotics
- Antimicrobial photodynamic therapy (a-PDT)

Caged-carvedilol as a new tool for visible-light photopharmacology of β-adrenoceptors in native tissues

Anna Duran-Corbera, Joan Font, Melissa Faria, Eva Prats, Marta Consegal, Juanlo Catena, Lourdes Muñoz, Demetrio Raldua, Antonio Rodriguez-Sinovas, Amadeu Llebaria, Xavier Rovira

iScience, Volume 25, Issue 10, 21 October 2022 https://doi.org/10.1016/j.isci.2022.105128

- ultraviolet light
- photopharmacology
- Light surveying
- β-adrenergic receptor

Design and development of photoswitchable DFG-Out RET kinase inhibitors

Yongjin Xu, Chunxia Gao, Måns Andreasson, Liliana Håversen, Marta P Carrasco, Cassandra Fleming, Thomas Lundbäck, Joakim Andréasson, Morten Grøtli

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- ultraviolet light
- photopharmacology
- Optical switching molecules
- cancer
- Thyroid cancer
- lung cancer

Agonists and allosteric modulators promote signaling from different metabotropic glutamate receptor 5 conformations

Chady Nasrallah, Giuseppe Cannone, Julie Briot, Karine Rottier, Alice E Berizzi, Chia-Ying Huang, Robert B Quast, Francois Hoh, Jean-Louis Banères, Fanny Malhaire, Ludovic Berto, Anaëlle Dumazer, Joan Font-Ingles, Xavier Gómez-Santacana, Juanlo Catena, Julie Kniazeff, Cyril Goudet, Amadeu Llebaria, Jean-Philippe Pin, Kutti R

Vinothkumar, Guillaume Lebon

Cell Rep . 2021 Aug 31;36(9):109648. doi: 10.1016/j.celrep.2021.109648.

- ultraviolet light
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- Metabotropic glutamate receptors

On-DNA Derivatization of Quinoxalin-2-ones by Visible-Light-Triggered Alkylation with Carboxylic Acids

Yue Zhang, Huadong Luo, Huiyong Ma, Jinqiao Wan, Yue Ji, Alex Shaginian, Jin Li, Yun Deng, Guansai Liu

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- blue light
- photopharmacology
- Photochemistry

Using Light to Regulate the Activity of RET Kinase

Yongjin Xu

University of Gothenburg 2021

- ultraviolet light
- photopharmacology
- Optical switching molecules
- cancer
- Thyroid cancer
- lung cancer

Mechanistic insights into light-driven allosteric control of GPCR biological activity

Maria Ricart Ortega, Alice E. Berizzi, Vanessa Pereira, Fanny Malhaire, Juanlo Catena, Joan Font, Xavier Gomez-Santacana, Lourdes Muñoz, Charleine Zussy, Carmen Serra, xavier Rovira, Cyril Goudet, and Amadeu Llebaria

ACS Pharmacol. Transl. Sci. 2020Aug DOI: 10.1021/acsptsci.0c00054

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- Green light
- photopharmacology
- Optical switching molecules
- Metabotropic glutamate receptors

Photoswitchable Antagonists for a Precise Spatiotemporal Control of β2-Adrenoceptors

Anna Duran-Corbera, Juanlo Catena, Marta Otero-Viñas, Amadeu Llebaria, Xavier Rovira

J. Med. Chem. 2020, 63, 15, 8458-8470 DOI: 10.1021/acs.jmedchem.0c00831

- ultraviolet light
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- photopharmacology
- Optical switching molecules

- β-adrenergic receptor