

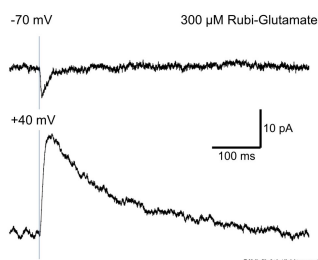
DATASHEET

RuBi-Glutamate

Product overview

Name	RuBi-Glutamate
Cat No	HB0567
Biological description	<p>Ruthenium-bipyridine-trimethylphosphine (RuBi) - caged glutamate. Water soluble.</p> <p>RuBi-Glutamate can be excited by visible wavelengths and releases glutamate after one- or two-photon excitation. Glutamate release occurs in less than 50 ns. Displays fewer non-specific effects than MNI-caged-Glutamate.</p> <p>RuBi-Glutamate has a relatively high absorption cross section in the visible (blue) and has a high quantum efficiency of uncaging which allows use at low concentrations (e.g. lower concentrations than MNI-Glu). This partly avoids blockade of GABAergic transmission which occurs with other caged compounds.</p> <p>Two-photon uncaging of RuBi-Glutamate has a high spatial resolution and generates excitatory responses in individual dendritic spines with physiological kinetics. With laser beam multiplexing, two-photon RuBi-Glutamate uncaging can also be used to depolarize and fire pyramidal neurons with single-cell resolution.</p> <p>Therefore, RuBi-Glutamate enables photoactivation of neuronal dendrites and circuits with visible or two-photon light sources at single cell and single spine precision.</p> <p>When combined with RuBi-Glutamate uncaging, two-photon photostimulation can be applied to optically map inhibitory connections.</p>
Alternative names	RuBi-Glu, RuBglutamate
Biological action	Caged compound
Customer comments	<p><i>Hello Bio produce very high quality Rubi-Glutamate, which is capable of evoking single spine synaptic currents following 2-photon activation. The spatial and temporal dynamics of the uncaging are suitable for fast photolysis, mimicking accurately endogenous glutamate release. Verified customer, The University of Edinburgh</i></p>
Description	RuBi - caged glutamate compound. Water soluble.

Images



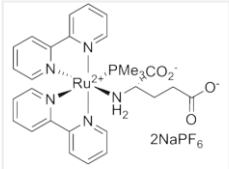
Biological Data

Application notes	<p>Uncaging of Rubi-Glutamate using a 0.5 μm spot of 780 nm light for 2 ms (blue line), 1 μm adjacent to dendritic spines (average of 8 spine shown) in a CA1 pyramidal cell from a 28 day old rat.</p> <p>Traces were acquired using a cesium gluconate based intracellular solution in voltage-clamp configuration, in the presence of bath applied 300 μM Rubi-Glutamate and 50 μM picrotoxin (also Hello Bio), producing small AMPA EPSCs at -70 mV (top) and large NMDA EPSCs at +40 mV (bottom).</p>
--------------------------	--

Solubility & Handling

Storage instructions	-20 °C
Solubility overview	Soluble in water (20mM)
Handling	This compound is light sensitive; exposure to light may affect compound performance. We therefore recommend storing the material in the dark and protecting from light.
Important	This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use.

Chemical Data

Chemical name	(bis(2,2'-Bipyridine- <i>N,N'</i>)-trimethylphosphine)-(S)-1-aminopropane-1,3-dicarboxylic acid ruthenium(2 ⁺) complex sodium hexafluorophosphate salt
Molecular Weight	970.54
Chemical structure	
Molecular Formula	C ₂₈ H ₃₂ N ₅ O ₄ PRu.2NaPF ₆
CAS Number	2417096-44-5
PubChem identifier	90488860
SMILES	CP(C)C.C1=CC=NC(=C1)C2=CC=CC=N2.C1=CC=NC(=C1)C2=CC=CC=N2.C(CC(=O)[O-])C(C(=O)[O-])N.F[P-](F)(F)(F)F.F[P-](F)(F)(F)F.[Na+].[Na+].[Ru+2]
Source	Synthetic
InChiKey	SQQVSHWHIPVYSZ-UHFFFAOYSA-L
Appearance	Orange solid

References

RuBi-Glutamate: Two-Photon and Visible-Light Photoactivation of Neurons and Dendritic spines.

Fino E *et al* (2009) Front Neural Circuits 3
PubMedID [19506708](#)

A fast ruthenium polypyridine cage complex photoreleases glutamate with visible or IR light in one and two photon regimes.

Salierno M *et al* (2010) J Inorg Biochem 104(4)
PubMedID [20060592](#)

Dense, unspecific connectivity of neocortical parvalbumin-positive interneurons: a canonical microcircuit for inhibition?

Packer AM *et al* (2011) J Neurosci 31(37)
PubMedID [21917809](#)

Dense inhibitory connectivity in neocortex.

Fino and Yuste (2011) Neuron. 69(6)
PubMedID [21435562](#)