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Coelenterazine Analogs

Coelenterazine and its analogs are luminescent enzyme substrates for apoaequorin and *Renilla* luciferase.



Product attributes

CAS number	114496-02-5, 123437-16-1, 123437-22-9, 123437-25-2, 123437-32-1, 123437-33-2, 50909-86-9, 55779-48-1, 70217-82-2

Product Description

Coelenterazine and its analogs are luminescent enzyme substrates for apoaequorin and *Renilla* luciferase. Apoaequorin is used as a calcium indicator whereas *Renilla* luciferase is commonly used as a reporter of transcription regulation. Coelenterazine binds to apoaequorin to form aequorin which emits light upon binding to calcium. Aequorin can be used to measure a broad concentration range of calcium from ~0.1 uM to >100 uM. *Renilla* luciferase has been widely used as a reporter protein and as a bioluminescence donor in bioluminescence resonance energy transfer (BRET) to study protein-protein interactions. Other uses of coelenterazine include chemiluminescent detection of superoxide anion and peroxynitrite in cells or tissues.

Can't decide which coelenterazine analog to use? Try our Coelenterazine Sampler Kit (catalog no. 10123). The kit includes 25 ug each of nine coelenterazine analogs including native, cp, f, fcp, h, hcp, i, ip and n.

Product	Catalog Number	MW	Format
Coelenterazine Sampler Kit	10123	---	25 ug each of nine coelenterazine analogs: native, cp, f, fcp, h, hcp, i, ip and n
Aquaphile™ Coelenterazine (native)	10126	423.5	Yellow solid soluble in water or PBS buffer
Aquaphile™ Coelenterazine h	10127	407.5	Yellow solid soluble in water or PBS buffer
Coelenterazine (native)	10110	423.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine h	10111	407.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine cp	10112	415.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine hcp	10113	399.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine f	10114	425.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine n	10115	457.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine ip	10116	389.5	Yellow solid soluble in MeOH or EtOH
Coelenterazine fcp	10117	417.5	Yellow solid soluble in MeOH
Coelenterazine i	10121	533.4	Yellow solid soluble in MeOH or EtOH
Coelenterazine e	10124	449.5	Dark brown solid soluble in MeOH and EtOH
Coelenterazine 400a (DeepBlueC™)	10125	391.5	Off-white to pinkish solid soluble in EtOH
Methyl Coelenterazine	10122	331.4	Yellow solid soluble in MeOH and EtOH

There are over a dozen of coelenterazine analogs that have been synthesized, many of which are now commercially available from Biotium. These coelenterazine analogs have different properties in terms of emission wavelength, cell membrane permeability and quantum efficiency. Table 1 and Table 2 summarize the luminescent properties of coelenterazine derivatives with *Renilla* luciferase and apoaequorin respectively.

Biotium offers coelenterazine 400a (also known as DeepBlue C™) (catalog no. 10124) which serves as a substrate for *Renilla* luciferase (Rluc) and generates an emission peak centered around 400 nm. It is the preferred *Renilla* luciferase substrate for BRET studies because it has minimal interference with the emission of the GFP acceptor.

Also, see our water soluble Aquaphile™ Coelenterazines, sold as coelenterazine native (catalog no. 10126) or coelenterzine h analog (catalog no. 10127). These formulations readily dissolve in water or buffer for *in vivo* use.

Lastly, Biotium offers methyl coelenterazine (coelenterazine, 2-methyl analog) (catalog no. 10122) which has been reported to be a superior antioxidant for cells against reactive oxygen species (ROS) such as singlet oxygen and superoxide anion. The coelenterazine derivative is membrane-permeant, non-toxic and highly reactive toward ROS. See the coelenterazine flyer under supporting documents for a comparison of coelenterazine analogs.

Table 1. Luminescent Properties of Coelenterazine Analogs with Renilla Luciferase*

Analog	Emission Max (nm)	Total Light (%)	Initial Intensity
Coelenterazine (native)	475	100	45

Analog	Emission Max (nm)	Total Light (%)	Initial Intensity
Coelenterazine h	475	41	135
Coelenterazine cp	470	23	135
Coelenterazine f	473	28	45
Coelenterazine n	475	47	900
Coelenterazine e	418, 475	137	900
Coelenterazine 400a (DeepBlueC)	400	---	---

*Data from Biochem. Biophys. Res. Commun. 233,349 (1997).

Table 2. Luminescent Properties of Coelenterazine Analogs with Apoaequorin*

Analog	Emission Max (nm)	Relative Luminescence Capacity	Relative Intensity	Half-rise Time (s)
Coelenterazine (native)	465	100	1.00	0.4-0.8
Coelenterazine h	475	0.82	10	0.4-0.8
Coelenterazine cp	442	0.95	15	0.15-0.3
Coelenterazine hcp	444	0.67	190	0.15-0.3
Coelenterazine f	473	0.80	18	0.4-0.8
Coelenterazine n	467	0.26	0.01	5
Coelenterazine ip	441	0.54	47	1
Coelenterazine fcp	452	0.57	135	0.4-0.8
Coelenterazine i	476	0.70	0.03	8
Coelenterazine e	405, 465	0.50	4	0.15-0.3

*Data from Biochem. J. 261, 913 (1989)

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