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Fungal bioluminescence system: luciferin, luciferase and luciferin biosynthesis

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Many living organisms emit light, a phenomenon named bioluminescence. There are estimated to exist ~40 different chemical mechanisms underlying the generation of “cold light”. The energy required for light production is generated by the oxidation of a small organic molecule, luciferin, catalyzed by a specific enzyme, luciferase. More than 100 species of bioluminescent higher fungi are known. The international research group led by the speaker reported elucidation of fungal luciferin in 2015. In 2016, the same group identified and cloned fungal luciferase and the enzymes of luciferin biosynthesis (publications in press). Discussed will be structure elucidation of fungal luciferin, cloning of fungal bioluminescence enzymes, light emission mechanism and perspectives of practical applications of fungal bioluminescence.

Biography

Iliia V Yampolsky has completed his PhD from Institute of Bioorganic Chemistry (Moscow) in the field of chemistry of red fluorescent proteins' chromophores and his DrSc in bioluminescence mechanisms. He is the Head of Total Synthesis Lab at the same institute. He has published more than 40 papers in reputed journals. His research interests include fluorescence and luminescence in nature, natural products isolation, function and biosynthesis.

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Hans Waldenmaier has completed his PhD in Biochemistry at the age of 31 years from the University of Sao Paulo, Brazil. Hans also earned a Masters degree in Botany from Miami University in Oxford Ohio and prior to that a BSc in Biochemistry at Clemson University. Currently he is developing a botany based biotech startup focused on bioluminescence. He is one of the foremost experts of fungal bioluminescence, with extensive field experience studying the ecology of the phenomena as well as a deep understanding of the molecular nature of the trait.

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