

Recent patents and applications in optogenetics

Patent/application number	Description	Assignee	Inventor	Date
US 9,046,659	A dual optical path rotary joint providing a low-friction coupling of optical fiber connections for optogenetic research and other applications. Two optical paths are provided through the rotary joint, which are rotation-insensitive. The ends of the rotary joint rotate with respect to a common housing, which may be provided with ball-bearings or other suitable low-friction rotational mounts in which a first rotating component and a second rotating component are secured.	Optomak (Quebec, Canada)	Doric S	6/2/2015 (issued)
US 8,868,351	Systems and methods for estimating a volume of tissue directly influenced by optogenetic stimulation; can also enable a user to quantitatively predict the spread of stimulation (e.g., action potential) resulting from optical stimulation in a patient's tissue.	The Cleveland Clinic Foundation (Cleveland, OH, USA)	McIntyre CC, Foutz TJ	10/21/2014 (issued)
US 8,834,546	Systems and methods involving the use of MRI and optogenetic neural stimulation; modifying a target neural cell population in a first region of a brain to express light-responsive molecules. Using a light pulse, the light-responsive molecules in the target neural cell population are stimulated. Multiple regions of the brain are scanned via MRI. The scans allow for observation of a neural reaction in response to the stimulation in at least one of the multiple regions of the brain.	Board of Trustees of Stanford University (Palo Alto, CA, USA)	Deisseroth K, Lee JH	9/16/2014 (issued)
US 8,580,937	Methods and compositions used to identify and characterize new channelrhodopsins derived from algae and several of which are red-shifted. The rhodopsin domain of these red-shifted channelrhodopsins can be cloned and expressed in mammalian systems and used in optogenetic applications and as therapeutic agents. Also, methods and compositions for use in red-shifting the absorbance maxima of channelrhodopsins in order to improve their utility for use <i>in vivo</i> .	Board of Regents of the University of Texas System (Austin, TX, USA)	Spudich JL, Govorunova EG, Sineshchekov OA	11/12/2013 (issued)
US2015196773	Methods for regulating vascular properties by controlling the membrane properties of endothelial cells using optogenetics and light, e.g., methods to transport therapeutics across the vascular barrier into tissues such as the brain and the lung, with high spatial and temporal precision, and for controlling vascular properties such as vascular tone, arterial diameter and vascular growth.	Brown TC, Moore CI	Brown University (Providence, RI, USA), Massachusetts Institute of Technology (Cambridge, MA, USA)	7/16/2015 (published)
US2015148643	Integrated light-emitting medical devices (e.g., neural devices) capable of being used in optogenetics and a method of manufacturing said medical devices.	mLED (Glasgow)	Small J, Bonar JR, Gong Z, Valentine JG, Gu E, Dawson MD	5/28/2015 (published)
KR20150000218	A light-emitting device for an optogenetics simulation, which is inserted into a human body. The light-emitting unit is an organic light-emitting diode.	Yonsei University Industry-Academic Cooperation Foundation (Seoul)	Kim YJ, Joo CM, Kim MS	1/2/2015 (published)
US2014323924	Methods and systems for neuromodulation of deep-brain and other neural targets in mammals using optogenetics to treat clinical conditions or achievement of a physiological state. The neuromodulation can produce acute or long-term effects.	Mishevich DJ	Mishevich DJ	10/30/2014 (published)
US2014295413	Methods for characterizing cellular physiology by incorporating into an electrically excitable cell an optical reporter of, and an optical actuator of, electrical activity; provides all optical methods that may be used instead of, or as a complement to, traditional patch clamp technologies and that can provide rapid, accurate and flexible assays of cellular physiology.	President and Fellows of Harvard College (Cambridge, MA, USA)	Cohen AE, Kralj J, Douglass AD, Hochbaum D	10/2/2014 (published)

Source: US Patent and Trademark Office (<http://www.uspto.gov>); European Patent Office (<http://www.epo.org>).

