Special Issue

The Advances and Applications of Optogenetics

Message from the Guest Editors

When Karl Deisseroth coined the word “optogenetics” in 2006, he had in mind using genetically-encoded actuators to control the membrane potential and, thus, cellular excitability with light. Recruiting microbial rhodopsins to this end has yielded a revolution in neuroscience, led to clinical trials to cure blindness and is considered for the treatment of many psychiatric and neurological disorders. Other light-sensitive protein domains, mostly of plant origin, have been harnessed for photoregulation of gene expression, protein activity, oligomerization and trafficking. These efforts have been complemented by engineering proteins to bind photoswitchable ligands. Finally, an array of photosensors responsive to physiological changes in the membrane voltage or intracellular concentrations of specific ions has been created, leading to the possibility of all-optical interrogation of cellular activity. This Special Issue focuses on recent advances in the ever-broadening and exciting field of optogenetics that are expected to boost both fundamental research and clinical practice.

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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