

國立臺灣大學技術行銷表

台大案號: _____ (由產學合作中心填寫)

產學合作中心聯絡人:

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產品/技術名稱	<p>(可自行以較適合/較生活化的名稱代替，而不一定要呈現出“專利名稱”)</p> <p>人工視神經與其末端光電轉換器 An Artificial Optical Optic Nerve with an Opto-Electric Converter at Its End</p>
發明人/單位	<p>王倫/台大光電所</p>
產品/技術說明	<p>(非機密性技術內容描述，以供推廣或外界參考 (100 字內))</p> <p>利用浸泡式或沉積式等各種太陽能電池薄膜製程，在光纖表面上製作能將光能轉換成電能的單層或多層薄膜結構，藉由光纖的良好導光特性、長度長與等效側壁面積大的優勢，能有效地將光纖一端收入的光吸收並轉換成足量的電能訊號，並藉由光纖另一末端製成尖端形狀的電極，用於刺激微小的生物細胞。</p>
應用範圍	<p>(可以列舉的方式說明)</p> <p>光電刺激生物細胞：光電視神經、其他可運用範圍例如光電周邊神經、中樞神經及肌肉刺激、光電心律調節器運用。</p>
產品/技術優勢	<p>(與現有之技術相比較後，列舉此項技術的優點)</p> <ol style="list-style-type: none"> 1. 使用光纖側壁的等效大面積來增加光的吸收量，有效提升光電轉換效率。 2. 末端是特殊製成的針狀體做為電極，可以刺激單一個微小細胞。 3. 可以適用於各種周邊性視力受損的病患，只要腦部視區還是健康的，例如視網膜細胞受損或視神經受損者皆可適用。相對於目前較主流的研究—使用感光晶片固定在視網膜上刺激深層柱狀和錐狀細胞，仍然需要依靠殘餘健康的視神經細胞才能作用，但對於嚴重視神經缺損患者則無法運用。
市場潛力	<p>(可用量化方式說明市場潛力，或預估可帶來的效益等)</p> <ol style="list-style-type: none"> 1. 可為視障者帶來光明，改善生活品質。 2. 提供另一種形式的光電電極可供給細胞學或神經電生理學和臨床研究運用。

產品/技術 智財權保護方 式	(由產學合作中心填寫)
圖片 (已公開之成果 可提供圖片)	(具有代表性的圖片可直接展現成果，增加行銷之吸引力，有助提升 推廣效益。)

Marketing Abstract of NTU's Invention Disclosure

NTU's docket no: _____ (由產學合作中心填寫)

CIAC contact :

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e-mail :

Title	An Artificial Optical Optic Nerve with an Opto-Electric Converter at Its End
Inventor (s)	Lon Wang, et al
Brief Description	<p>(≤ 100 words of non-confidential information)</p> <p>A single-layer film or a film stack of photovoltaic (solar cell) materials is coated over a tapered optical fiber by employing methods such as chemical solution or physical deposition. Attributed to the large effective area of the fiber side wall over a distance, the guided light can be efficiently converted to electrical energy. And the tapered end is thin enough to serve as an electrode tip to stimulate a single biological cell.</p>

Fields of Application	Neuronal stimulation by opto-electric device : optic nerve projected neurons in occipital lobe、neuromuscular junction、peripheral nerves、central nervous system、and AV node in the heart
Advantages	<p>(when compared to the existing technologies)</p> <ol style="list-style-type: none"> 1. The side wall of an optical fiber over a distance can effectively increase interaction area and enhance light absorption, leading a higher opto-to-electric conversion efficiency. 2. The optical fiber end has a fine needle tip which serves as electrode and can be used to stimulate a single cell. 3. This device can be applied to a variety of visually impaired patients as long as the occipital lobe remains intact. The mainstream retinal prosthesis used today is to fix an electronic chip on retina and to stimulate the retinal ganglion cell or nerve fiber layer. Such methods generally require some residual healthy optic nerve fibers or retinal ganglion cells, which are not always the case in patients with severe retinal degeneration, retinal atrophy and optic nerve atrophy..
Market Potential	<ol style="list-style-type: none"> 1. This device can be applied to restore functional vision of these visually impaired patients, and improve their life quality. 2. We also can provide another option of opto-to-electrical convertor for studies in electrophysiology, neuroscience, neurology and rehabilitation for those patients with severe spinal cord injury, brain damages and neuromuscular disorders.
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