

P14. Multidisciplinary

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Bokyung Seo<sup>1),2)</sup>, Jae Yeon Park<sup>3)</sup>, Jimin Gu<sup>1)</sup>, Hyunjin Kim<sup>1)</sup>, Kihun Lee<sup>1)</sup>, Seung Mo Jeong<sup>1)</sup>, Heeju Mun<sup>1)</sup>, Jeehyun Joung<sup>4)</sup>, Kiuk Gwak<sup>5)</sup>, Jeounghoon Kim<sup>4)</sup>, Jeonggil Ko<sup>3)</sup>, Ki-Uk Kyung<sup>1)</sup>, and Inkyu Park<sup>1),†</sup>  
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Longlong Li<sup>1)</sup>, Nomin-Erdene Oyunbaatar<sup>1)</sup>, Jongyun Kim<sup>1)</sup>, and Dong-Weon Lee<sup>1),2),†</sup>  
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Karthikeyan Munirathinam<sup>1)</sup> and Dong-Weon Lee<sup>1),2),†</sup>  
*<sup>1)</sup>Department of Mechanical Engineering, Chonnam National University, <sup>2)</sup>Center for Next-generation Research and Development, Chonnam National University ... 330*
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Muhammad Ali Shah<sup>1)</sup>, Turab Haider<sup>1),2)</sup>, and Shin Hur<sup>1),2),†</sup>  
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Biswajit Mahanty<sup>1)</sup>, and Dong-Weon Lee<sup>1),2),†</sup>  
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# The hybrid cantilever of conductive graphene and SU-8 for improving the electrical coupling of cardiomyocytes

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## Abstract

Heart failure resulting from cardiac drug toxicity is still shows a significant problem worldwide [1]. To address this issue, drug evaluation platforms has been developed and characterized in *in-vitro*. The conductive substrate is one of the efficient ways for evaluating drug screening on cardiomyocytes in stage of maturation. The gold is commonly used as a conductive material for promoting maturation during the culture of cardiomyocytes. However, it has nature limits of transparency, the ability to observe and monitor cell growth effectively through a microscope [2]. Therefore, in this work, we propose a novel a hybrid cantilever platform that utilized graphene with unique transferring method. The schematic of proposed conductive platform was shown in Fig.1a. The experiment was carried out and demonstrated the benefits of using graphene as a conductive substrate with the primary cardiomyocytes (NRVM). The beating pattern of the cardiomyocytes was characterized on the without and with conductive substrate. The ROI (region of interest) contractile pattern on different substrate was shown in Fig.1b and c, respectively. The experiment result shown that the conductive surface has uniform synchronized beating pattern which confirm that coupling effect of the cell to cell.

**Keywords:** Cardiomyocytes, Cell connection, Conductive surface, Cantilever, Graphene transfer

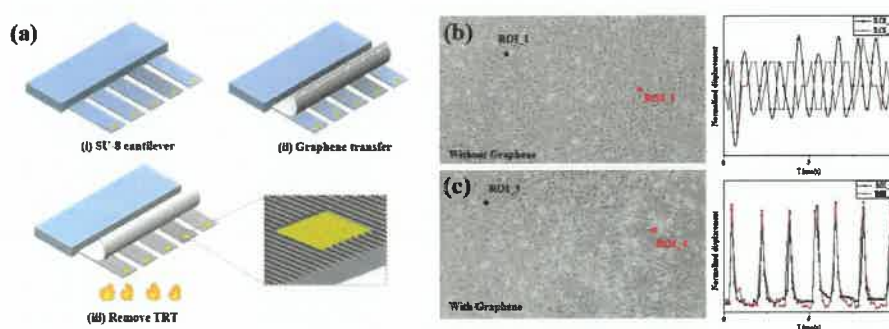


Fig. 1. (a) Schematics of the SU-8/Graphene cantilever cell culture platform, (b) and (c) NRVM morphology and beating pattern on without and with conductive surface.

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