

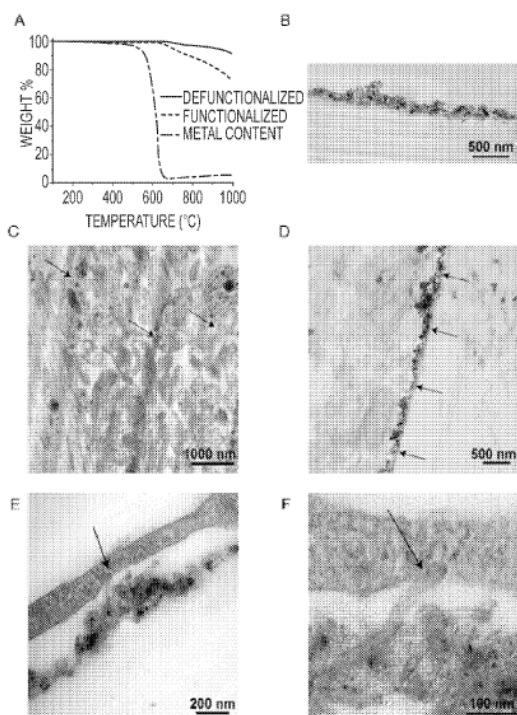


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## **CARBON-NANOTUBE MODULATION OF MYOCYTE CELLS**

Carbon-nanotube compositions complexed with myocyte cells, methods of using and making the same



Category:

**Life Sciences**

Patent Ownership:

**UNIVERSITA' DI TRIESTE, INTERNATIONAL CENTRE FOR GENETIC ENGINEERING AND BIOTECHNOLOGY, THE REGENTS OF THE UNIVERSITY OF COLORADO**

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Priority Date:

**13/03/2012**

Patent Number:

**US214/005.21**

Patent Status:

**Patent Pending in US**

Licensing Availability:

**Available**

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### **Brief description**

The present disclosure relates to the field of carbon nanotube (CNT) compositions that are complexed with myocyte cells and methods of making and using the same. Specifically, CNT complexes with cardiac myocyte, methods of improving the electrophysical properties, and methods of stimulating the proliferative capacity of myocyte cells are provided.

### **Innovative aspects and main advantages**

Carbon nanotube scaffolds have been found to promote growth, differentiation and survival of neurons and to modify their electrophysiological properties. The inventors hypothesized that similar effects might be seen in cardiac myocytes, which share several molecular and electrophysiological properties with neurons. Microscopy, biological and single-cell electrophysiological methodologies have been combined to examine the phenotype of neonatal rat ventricular myocytes (NRVM) cultured on substrates of multiwall carbon nanotubes (MWCNTs)

or on gelatin (control). With transmission electron microscopy, NRVM membranes interact with carbon nanotubes by forming tight contacts. Compared to control, NRVM grown on carbon nanotube platforms showed both increased viability and proliferation. Changes in the electrophysiological properties of NRVM on carbon nanotubes suggest that the MWCNTs may promote cardiac myocyte maturation.

### **Applications**

Results of this invention hold the potential for the development of innovative clinical, pharmacological and tissue engineering applications for carbon nanotube-based devices in cardiac disease.

### **Potential market**

The whole pharmaceutical industry should be interested in this invention.

### **Development status**

Technology validated at lab level.

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