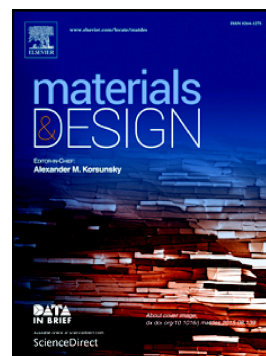


Accepted Manuscript

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PII: S0264-1275(17)30430-6
DOI: doi: [10.1016/j.matdes.2017.04.074](https://doi.org/10.1016/j.matdes.2017.04.074)
Reference: JMADE 2996

To appear in: *Materials & Design*

Received date: 11 January 2017
Revised date: 20 April 2017
Accepted date: 21 April 2017

Please cite this article as: Bruno V.M. Rodrigues, Claudia A. Razzino, Francilio de Carvalho Oliveira, Fernanda R. Marciano, Anderson O. Lobo , On the design and properties of scaffolds based on vertically aligned carbon nanotubes transferred onto electrospun poly (lactic acid) fibers. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Jmade(2017), doi: [10.1016/j.matdes.2017.04.074](https://doi.org/10.1016/j.matdes.2017.04.074)

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On the design and properties of scaffolds based on vertically aligned carbon nanotubes transferred onto electrospun poly (lactic acid) fibers

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Abstract - Herein, we propose the design of a nanoscaffold based on the hot-press transfer of vertically aligned multi-walled carbon nanotubes (VAMWCNT) onto matrices of electrospun poly (lactic acid) (PLA) fibers. To this end, we created a three-dimensional, bioactive and electrically conductive scaffold that combines the potential of PLA as a biomaterial with the physical-chemical and biological properties of VAMWCNT (PLA/VAMWCNT). Given the well-known hydrophobicity of carbon nanotubes, oxygen-plasma functionalization was applied to the scaffolds in order to attach oxygen-containing groups to their surfaces, with the plasma treatment also responsible for the exfoliation of the VAMWCNT's tips. After plasma-functionalization, electrochemical measurements showed that our scaffold presented an increased electroactive area (1.5-fold) with a k^o value of $6.87 \times 10^{-3} \text{ cm s}^{-1}$, confirming its applicability as an electrode. Furthermore, we have also demonstrated the feasibility of electrodepositing nanohydroxyapatite (nHAp) crystals onto this nanoarchitected material, improving its biomimetic and bioactive features. Preliminary biological

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