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**Nome: TOP023 - Materiais grafênicos: propriedades e bioaplicações**

**Nível: M/D Obrigatória: Não Carga Horária: 30h Número de Créditos: 02**

**Professor(es) : Clascídia Aparecida Furtado e Estefânia Mara do Nascimento Martins**

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### **Ementa**

A disciplina pretende explorar as propriedades e manipulação química pós síntese dos nanomateriais grafênicos para aplicações biomédicas e suas perspectivas nanotoxicológicas.

#### **Programa**

- Introdução aos materiais grafênicos
- Síntese, purificação e funcionalização de materiais grafênicos para bioaplicações
- Caracterização de nanocomplexos baseados em materiais de carbono e biomoléculas
- Interações na interface Nano-Bio
- Nanotoxicologia
- Ensaio experimentais em biologia celular
- Bioaplicações

#### **Avaliação**

Discussões, seminários e estudos dirigidos

### **Bibliografia:**

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- 4 - S. Reich, C. Thomsen, J. Maultzsch, "Carbon Nanotubes – Basic Concepts and Physical Properties", Wiley-VCH Verlag GmbH & Co. KgaA, Weinheim, 2004.
- 5 - A. Jorio, G. Dresselhaus, M. Dresselhaus (Ed.), "Carbon Nanotubes; Advanced topics in the synthesis, structure, properties and applications. Berlin: Springer, 2008.
- 6 - V. A. Basiuk, E. V. Basiuk (Ed.), "Chemistry of Carbon Nanotubes – vols. 1-3", American Scientific Publishers, Stevenson Ranch, 2008.
- 7 - Nel, A. E *et al.* Understanding biophysicochemical interactions at the nano–bio interface, *nature materials* (2009); 8(543-557) DOI: 10.1038/nmat2442
- 8 - Balasubramanian, K. (ed); Burghard, M. (ed). Carbon Nanotubes: Methods and Protocols (Methods in Molecular Biology). Humana Press, 2010. 240 p.
- 9 - Pati, S. K (ed.); Enoki, T (ed.); Rao, C. N. R (ed.). Graphene and its fascinating attributes. New Jersey : Word Scientific, 2011. 270 p.
- 10 - Martin, N (ed); Nierengarten, J.F (ed). Supramolecular Chemistry of Fullerenes and Carbon Nanotubes. 1 ed. Weinheim: Wiley VCH, 2012. 418 p.

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- 11 - Backes, C. Noncovalent Functionalization of Carbon Nanotubes: Fundamental Aspects of Dispersion and Separation in Water. Springer Theses. Erlangen-Nürnberg : Springer, 2012. 203 p.
  - 12 - D'Souza, F (ed); Kadish, K. M (ed). Handbook of Carbon Nano Materials (In 2 Volumes) (World Scientific Series on Carbon Nanoscience). 1 ed. New Jersey: World Scientific Publishing Company, 2012. 824 p.
  - 13 - Neha B. Shah and John C. Bischof. Blood protein and blood cell interactions with gold nanoparticles: the need for in vivo studies, *BioNanoMat* (2013); 14(1-2): 65–79 DOI 10.1515/bnm- 2012-0003
  - 14 - Selbach, E. P. The millionaire investor: better than gold, diamonds or real-estate: graphene. S. L: ESAM, 2012. 177 p.
  - 15 - Katsnelson, M. Graphene: carbon in two dimensions. Cambridge : Cambridge University, 2012. 351 p. Warner, J. H et al. Graphene: fundamentals and emergent applications . Amsterdam: Elsevier, 2013. 450 p.
  - 16 - Rao, C. N. R (ed); Sood, A. K (ed). Graphene: synthesis, properties and phenomena. Weinheim: Wiley VCH, 2013. 416 p.
  - 17 - Enoki, T; Ando, T. Physics and chemistry of graphene: graphene to nanographene. Singapore : Pan Stanford, 2013. 351 p.
  - 18 - Morris, J. E (ed.); Iniewski, K (ed.). Graphene, carbon nanotubes and nanostructures: techniques and applications. Boca Raton : CRC Pr, 2013. 350 p.
  - 19 - Mertens, R. The Graphene Handbook. Herzelia: lulu.com , 2013. 112 p.
  - 20 - Kinoshita, K. Carbon: Electrochemical and Physicochemical Properties. 1 ed. Chichester: John Wiley & Sons, 1988. 560 p.
  - 21 - Alwarappan, S.; Kumar, A. Graphene-Based Materials: Science and Technology. Boca Raton: CRC Press, 2013. 224 p.
  - 22 - Navya and Daima. Rational engineering of physicochemical properties of nanomaterials for biomedical applications with nanotoxicological perspectives, *Nano Convergence* (2016) 3:1 DOI 10.1186/s40580-016-0064-z
  - 23 - E.M. do Nascimento Martins; Furtado, C. A. ; A. P. Santos ; L. M. de Andrade ; L.O. Luiz . Synthesis, Purification and Functionalization of Carbon Nanotubes for Biotechnological Applications. Synthesis, Purification and Functionalization of Carbon Nanotubes for Biotechnological Applications. 1ed.Switzerland: Springer, 2016, v. , p. 139-163.