

# Hybrid Graphene Hydrogels: Smart Materials for a Wide Range of Applications.

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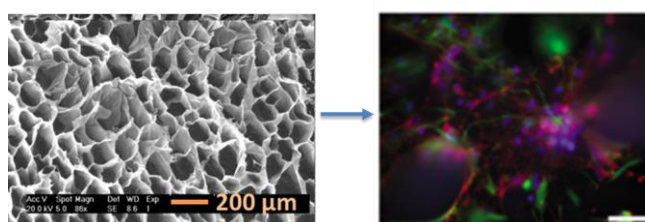
The synthesis of different soft hydrophilic polymeric networks, by in situ radical polymerization in the presence of graphene derivatives, is one of the followed approaches to attain a three-dimensional nanocomposite scaffold. The role of the nanomaterial within the polymer network is primarily intended for the reinforcing (i.e. increasing the stiffness and toughness). However, we have shown that the presence of graphene can also enhance features such as biocompatibility [1], smart behaviour based on responsiveness to external stimuli [2], sensing [3], or self-healing ability, giving rise to truly hybrid composites [4]. These syntheses require the production of large amounts of graphene materials in water, and for this reason, ball milling approaches developed in our labs, have proven a method of choice for the preparation of graphene starting materials [5].

## References

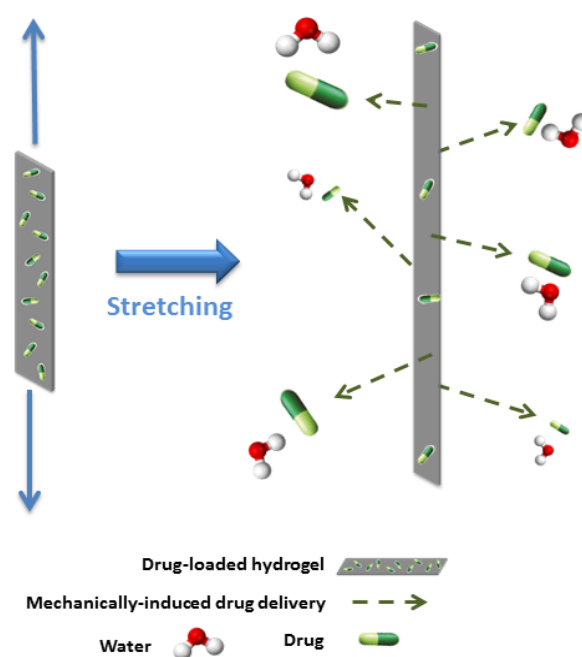
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## Figures



**Figure 1:** 3D graphene polymeric scaffolds for neuronal growth



**Figure 2:** Drug delivery system based on stimuli responsive graphene hybrid gel