

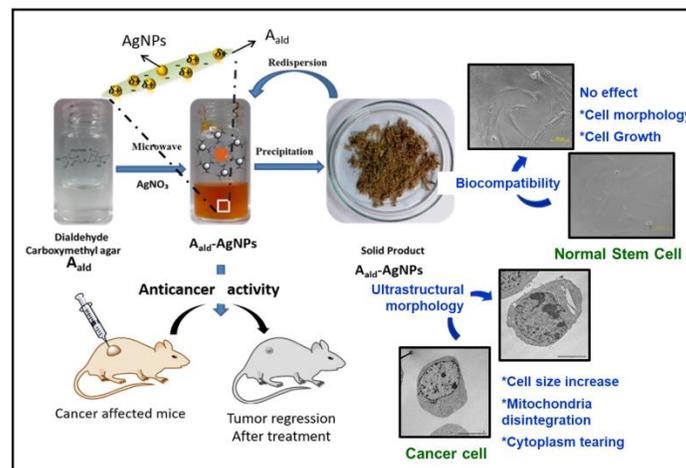
Dr.Jyoti Kode

Red seaweed polysaccharide derived nanocomposites help fight cancer



The researchers, led by Dr Jyoti Kode at the Advanced Centre for Treatment, Research & Education in Cancer, Tata Memorial Centre in Navi Mumbai, India, found that the nanocomposite controlled the growth of human colon, blood and breast cancer cells.

The nanocomposite, made using red seaweed-derived polysaccharide and silver nanoparticles, has been found to selectively kill the cancer cells, sparing healthy cells. These findings, the researchers say, show the potential applications of abundant, renewable seaweed biomass in developing cancer nanotherapy.



Graphical Abstract: This scheme illustrates process of synthesis and biological evaluation of nanocomposite as potential anti-cancer agent to reduce tumor in xenograft mice models. A ald -AgNPs are biocompatible and safe on normal stem cells.

Silver nanoparticles are coveted nanomaterials for their antimicrobial and anticancer properties. Existing methods to produce silver nanoparticles utilise toxic chemicals. Such nanoparticles tend to coalesce and lose efficiency if stored for a long time.

To overcome such drawbacks Dr. Ramavatar Meena from the CSIR-Central Salt & Marine Chemicals Research Institute in Gujarat isolated agar, a type of polysaccharide from a specific red seaweed and converted it into agar aldehyde. They then used agar aldehyde to synthesise silver nanoparticles. The nanoparticles and the aldehyde formed a nanocomposite, which stays stable and functional under ambient conditions for longer duration, says Dr Meena.

Dr Kode and her team grew tumours in mice using the human blood, colon and breast cancer cells. Treating the mice with the nanocomposite significantly reduced the volume of the tumours. The nanocomposite-treated mice didn't lose body weight. The nanocomposite did not hamper normal healthy gut immunity. The nanocomposite spared healthy cells, including stem cells. The stem cells have the potential to repair and regenerate organs damaged by cancers, says Dr Kode.



Kholiya F, Chatterjee S, Bhojani G, Sen S, Barkume M, Kasinathan NK, Kode J, Ramavatar M (2020). Seaweed polysaccharide derived bioaldehyde nanocomposite: Potential application in anticancer therapeutics. Carbohydrate Polymers. PMID: 32475566