

Indian-American chemist Sumita Mitra wins European Inventor Award 2021

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Sumita Mitra discovered that incorporating nanoparticles into dental materials can produce fillings that are stronger, more durable and more aesthetic



The European Patent Office (EPO) has honoured Indian-American chemist Sumita Mitra with the European Inventor Award 2021 in the 'Non-EPO countries' category. Mitra was the first to successfully integrate nanotechnology into dental materials to produce stronger and more aesthetically pleasing fillings, which are now used by dentists around the world.

“Mitra took an entirely new path in her field and demonstrated how technological innovation, protected by patents, can transform a sector, and in this case bring benefits to millions of dental patients,” says EPO President António Campinos. “Her invention remains commercially successful nearly 20 years after its launch – another reason why she is an inspiration to the next generation of scientists.”

While working in the oral care division of US multinational 3M in the late 1990s, Mitra became aware of the limitations of existing materials used in dental fillings, which were either too weak to be used on biting surfaces, or quickly lost their polish. At the same time, nanotechnology was emerging as a field of research and Mitra decided to explore how these new developments could be applied to dentistry. She began working on nanotechnology-based solutions for new dental material, driven by a desire to use her expertise in polymer chemistry and materials science to develop inventions that solve real-life problems.

Mitra and her team developed a technique for creating linked clusters of nanoparticles, which they called 'nanoclusters'. These clusters combine single nanoparticles of varying diameters, resulting in strong, durable and shiny material. By adding tiny amounts of pigment, and altering the chemical composition of the nanoparticles, the team was also able to create a range of different shades that can be matched to individual teeth and layered to create a more natural finish.

"The use of nanotechnology allowed me to make a new material," says Mitra. "It restores peoples smiles and improves the quality of their lives".

Mitra worked closely with 3M's patent attorneys to draft the patents to protect her ground-breaking research. Although several new generations of the material have been developed since its launch in 2002 as Filtek™ Supreme Universal Restorative, the current line of products is still based on Mitra's European patents.