Highlights:

Revolutionising healthcare: Plastics and Medical Applications

Next FuturEnergia chat will take place on 18 December from 10-11 CET. Due to the large success of the previous chat on Medical Applications, FuturEnergia will be running another chat on a similar topic: "Plastics and Medical Applications: Revolutionising healthcare". This chat will give students and teachers the possibility to ask further questions on the future of healthcare to Daniel Behrens, Marketing Manager Healthcare, Ticona. More info on his biography here.

By 2030, advances in medical science will mean a move from curing disease to preventing disease and extending life-spans. Children born then could have life expectancies stretching to 130 years.

Plastics will play an important role in this revolution. Today, already 45 % of medical products consist of polymers. We already rely heavily on plastics to protect drugs from contamination and deterioration, use them in radiation, heat-sterilisable syringes, blood and nutritional bags as well as tubing systems. Modern lightweight plastic ECG equipment can be worn for extended periods to provide more accurate information on the patient's condition. Plastic robots are being used increasingly to perform safer surgery; plastic receptacles deliver drugs to sites deep within the body and maintain anti-cancer drugs in blood plasma for longer periods than standard formulations. Plastics are also key components of modern prosthetic devices, providing comfort, flexibility mobility and a life-like appearance.

How has the use of plastics evolved in healthcare?

In recent years, the evolution of plastic materials has progressed hand-in-hand with healthcare developments. Researchers have developed new devices, including syringes, blisters, catheters and fluid bags. They have also developed new body parts to restore the functionality of hearts, joints, kidneys, ears, teeth and eyes. And it is in this context that plastics have proven themselves to be the ideal material, guaranteeing safety, hygiene and biocompatibility with the human body. Indeed, thanks to polymeric biocompatible solutions, it is now possible to apply reconstructive techniques to tendons and perform micro-probes. Plastics are also a crucial component in the hi-tech equipment and machinery used in hospitals, medical research, animal care and the veterinary sciences.

Why plastics as medical materials?

Plastics are easy to clean and sterilise, and contain intrinsic barrier properties against fluids, gases and pollutants. This explains why plastic applications are so widely used in hospital and healthcare facilities. For example, resilient flooring made of plastic allows for effective hygiene maintenance, polymeric fibres are used for surgical dressings, and plastic elements are also often used to insulate areas against infectious diseases.

Can Plastics be new medicine drivers?

In his 1966 short story Fantastic Voyage, scientist and science-fiction writer Isaac Asimov imagined miniaturized men injected into the human bloodstream to combat a blood clot. Today, laboratories all over the world have taken up Asimov's challenge and are exploring the potential of plastics-based micro-systems and nanotechnologies in medicine. This research includes the possibility of nanopolymers being used as carriers for drugs that directly target damaged cells, and of plastic micro-spirals being used to combat coronary diseases. Another use of plastics in this context is in micro-electromechanical systems. These are very small plastic devices being developed for biological applications. For example, simply placed on a small patch of the skin, they can give instantaneous readings of glucose or lactate levels. Future applications could include the detection of cancerous cells.

Q&A: INDICATIVE QUESTIONS CAN HELP STUDENTS BETTER UNDERSTAND THE TOPIC OF THE CHAT

These are some indicative questions that can help students better understand the topic of the chat. Students are encouraged to have a look at these questions in advance of the chat, do some background research, discuss in class and use these or other relevant questions when chatting with the expert.

1) Which most innovative things from plastic are useful today in medicine?

2) Where do you see the future of healthcare? Will doctors be replaced by robots one day?

3) Can you please give us examples of robots which are used in surgery?

4) Why is plastic more useful in medical situations then other materials?

5) Are plastics nowadays most acceptable and popular among patients?

6) What do you find most challenging in the future of healthcare?

NOW IT'S YOUR TURN TO PARTICIPATE
Would you like to participate? Are you interested in this event? Write to futurenergia@eun.org and register for this chat!

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