BRAC UNIVERSITY
Inspiring Excellence
Department of Pharmacy

PHARMA HIGHLIGHTS

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Webinar on 'Developing Professional Competence: The Role of Adaptability and Integrity'

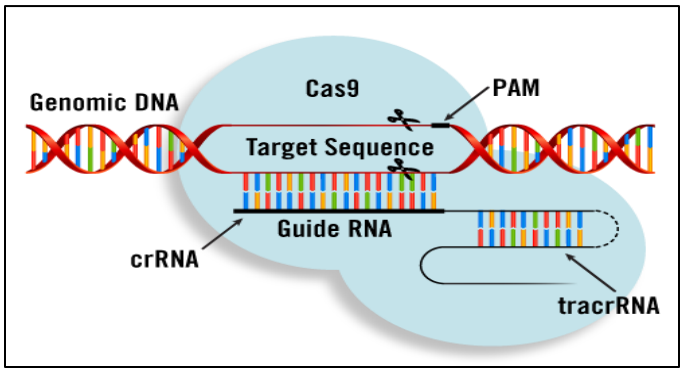

As part of our 'Toolbox for Success' series designed by the Department of Pharmacy, Brac University, a webinar on 'Developing Professional Competence: The Role of Adaptability and Integrity' was organized on November 21, 2020. The speakers of the webinar were Md. Tanbir Sajib, FCIM, Director of Commercial Affairs, Novo Nordisk Bangladesh; and M. Zulfiquer Hossain, Ph.D., Research Technology Specialist, Advanced Genomics and Cell Models, Merck KGaA, Darmstadt, Germany. Mr. Sajib and Dr. Hossain discussed the role of adaptability, integrity and flexibility in professional development. The webinar was moderated by Professor Dr. Eva Rahman Kabir, Chair, Department of Pharmacy, Brac University. The webinar was open to students and professionals from all areas and was live streamed on Facebook from the Department of Pharmacy, Brac University Facebook page.

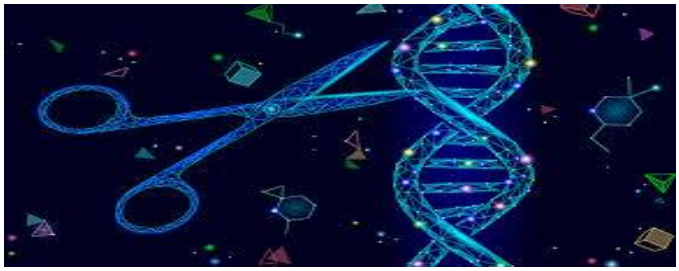
The questions asked by the participants were insightful and reflected their enthusiasm towards growing as competent professionals. The panelists emphasized that the world around us is changing faster than ever before and so is the nature of the workplace with the emergence of new expectations, needs, and job types. To thrive in this rapidly changing professional world, an individual needs to become professionally competent by acquiring certain soft skills.

Mr. Sajib has twenty one years of professional experience in leading global pharmaceutical companies including Roche, Novartis (Sandoz), Sanofi and Novo Nordisk; and Dr. Hossain, who is currently working as a Research Technology Specialist with Merck KGaA has also been an Associate Professor in the Department of Pharmacy, Brac University. The experiences of our speakers from both academia and industry made the webinar more comprehensive and also extremely interesting, especially for the students who are about to embark on the professional field and the young professionals who are preparing themselves for a successful career. Mr. Sajib and Dr. Hossain thanked the Department of Pharmacy for taking this initiative. They enjoyed and appreciated the interactive nature of the webinar.

Written by: Department of Pharmacy

CRISPR/Cas9 Gene Editing Technology





We use metal scissors to chop down the unwanted part of something. Likewise, CRISPR/Cas 9 gene editing system is currently one of the most exciting gene therapy topics. CRISPR is abbreviated from Clustered Regularly Interspaced Short Palindromic Repeats. This technology is a unique sequence of genetic code of various viruses. Thus, I would like to explain how CRISPR/ Cas 9 genetic tool does work. Cas 9 is one kind of endonuclease which cuts down the DNA of viruses. Cas 9, in this way, helps to delete or insert a new genetic sequence in the host cell. When the virus's DNA enters the host- genome's DNA, a certain fragment is called proto-spacers. These spacers are the location of cutting down the sequence situated in CRISPR-DNA. The spaces are like a molecular database/record for a previously infected virus at the host cell. The CRISPR-DNA gets transcribed to pre crRNA. Another tracr RNA associated with pre crRNA recruit enzymes to chop the pre crRNA. Thus, the mature CRISPR RNA are left and bind to tracr RNA. If the virus-

cell gets a return, Cas 9 easily recognize specific proto-space where 2-5 base pairs are conserved. CRISPR RNA and tracr RNA complex bind with the proto space and chop down the double-stranded DNA of the virus offender. This CRISPR/ Cas 9 genetic editor has become the evolutionary adaptation, hence the easiest and less time-consuming process than other genetic editors. This tool is used to treat chemotherapeutic drugs and identify new pathways to reduce or eliminate chemotherapy resistance in lung cancer, inherited genetic disorder, etc.

For instance, lately, CRISPR has been used as an experimental test to detect the novel coronavirus. In conclusion, this looks promising in the recent advancement of the medicinal field.

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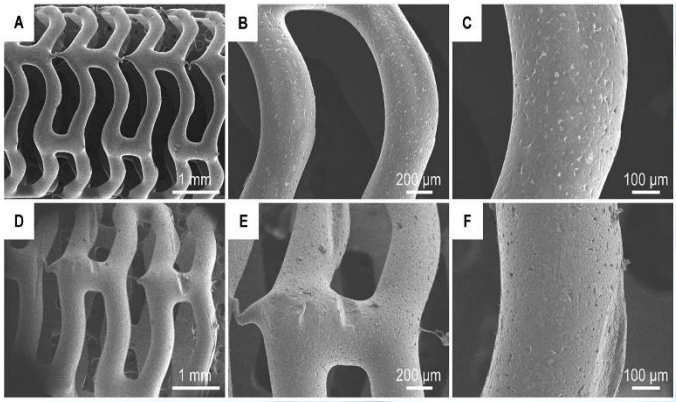
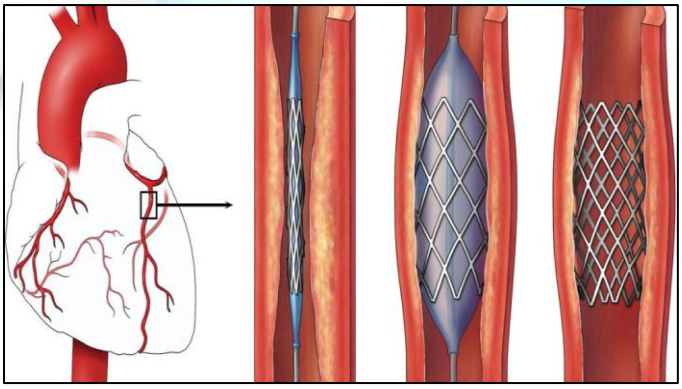
Evolution of 3D-Printed Bioresorbable Stents for Coronary Artery Disease



Coronary artery disease is an alarming threat for humans and percutaneous coronary intervention (PCI) with stent implantation can be a standard treating methodology to reestablish the blood stream. Bioresorbable stents(BRSs) have pulled in incredible consideration as potential candidate in treatment of coronary artery disease, since they are made of bioresorbable materials that can break-up or be ingested inside the human body, which can grant the mechanical back and after that disappear without causing long-term complications As of late, the 3D printing method has been considered as a variety in stent industry due to its focuses of intrigued in arrange personalization. A helical drug-coated has been fabricated PCL stent by utilizing 3D fast prototyping and awesome comes about were gotten from debasement test and creature tests. 3D printing methodology was as well utilized to fabricate PCL/PLA, PCL-GR synthesized stents. After performing physical and chemical tests, it is appeared that there were solid impacts of 3D printing process on the structural exactness but small impact on the composition of stents. Biological and mechanical investigation has appeared with great ascension with thorough necessities of BRSs proposing that 3D printing handle was exceedingly reasonable for fabricating synthesized stents. When these stents are in exposure to blood surface, contradiction can cause instantaneous and permanent complications like vessel hurt, thrombosis and disturbance. To control these problems, stent altered with chitosan(CS) may be a prospective strategy to progress the biological activity of cardiovascular restoration and intimal arrangement. Chitosan is a heparin-like polysaccharide which has pulled in colossal intrigued for a few highlights, counting hydrophilicity, biocompatibility, biodegradability, and bioactivity. Physical characterization shows that PCL stent gotten great surface which is reasonable for endothelial cell connection and development, by exterior adjustment of 26SCS. The degradation rate of PCL stent was made strides by using lysozyme. In vitro information illustrated that PCL stents had non-cytotoxicity, great blood and cell compatibility. Also 26SCS alteration seem improved their cell practicality and cell expansion. Inside and out, this on-going ponder assembles that PCL and S-PCL stents perhaps be a probable therapeutic appliance for coronary artery disease.



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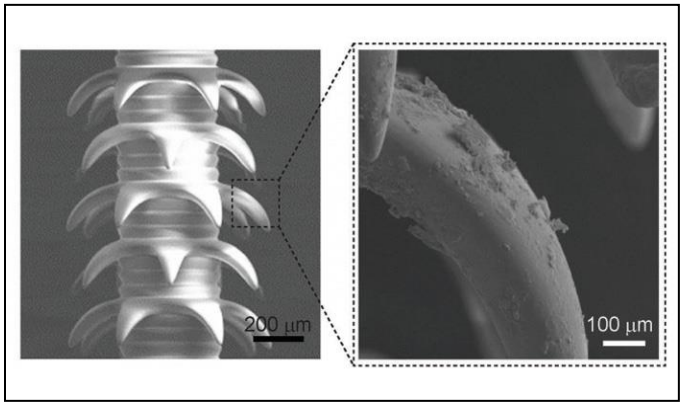
4D Microneedles, The Promising Replacement of Conventional Injections



According to The World Economic Forum, microneedles have been listed in top 10 Emerging technologies in 2020. Before jumping into 4D microneedles, let's dig into a little bit about microneedles. A layer of the skin named stratum corneum works as a skin barrier for transdermal administration of drugs hence allowing only few molecules to reach the target site. Thus, the therapeutic effects are limited for transdermal administrations. To overcome these problems, the microneedles are discovered to improve the efficacy. Microneedles first disrupts the layer of skin and then create micron size pathways which allow the drug directly to reach the upper dermis region. From that region, drug can easily go to the systemic circulation and then can directly reach to the site of action. By this mechanism, microneedles have overcome the limitations of conventional transdermal administration. 4D just has added a new dimension in microneedle field. Besides having more advantages, one of the major setbacks of microneedle is that the needles tend to become blunt during insertion which reduces the adherence capacity. To resolve the issue, the scientists came up with the 4D microneedles Technology. These needles have a unique design that is backward facing barbs in the needles. This design is inspired from living creatures such as microhooks of parasites, barbed stingers of honeybees etc. These backward facing barbs enter into the skin and become a one-way route by sticking with skin. These barbs increase the tissue adhesion 18 times higher than barbless microneedles. So now question is how can they replace conventional injections? Conventional injections are not pain free and can cause infections if they are administrated wrong. Besides, to administer conventional injections, proper training is needed. There are also lot of patients with needle phobia. On the other hand, 4D microneedles are pain free, easy to use, have a greater patient compliance since self-administration is possible. There is no chance of scarring as well. For diabetic patients, microneedles can offer less invasive techniques. Considering all the points, it can be concluded that 4D microneedles have been showed a promising future to replace the conventional injections.

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