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Opinion Article

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CRISPR-CAS: A Magical Tool for Human Welfareness

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INTRODUCTION

Now the world's health is in a challenging zone due to different reasons for anthropogenic activities of humans and people believe in fast life along with all facilities, where they ignored their health issues and get problems. The molecular gene editing technology CRISPR-Cas (Clustered Regularly Interspaced Short Palindromic Repeats) is wonderful method using to modify the genome of various organisms including human, where the role of biomolecules decreasing the risk of human health issues through this recent technique. The CRISPR technique is very simple, highly efficient, and easy to use why around the world it has dominantly severing by scientists in different aspects of human welfare. The various source of a living organism, who has a provider for the improvement of the human lifestyle. Crops, fruits, and vegetables are an essential part of human nutritional requirements and could be improved by CRISPR Technology. The variety of plants could be prepared by altering the process through CRISPR-Cas9 to enhance the quality of products. For example, tomatoes were modified by CRISPR to enhance flavor, sugar content, and aroma as compared to modern commercial varieties enhanced the nutritional content, manage the fruit ripening process, enhanced the color intensity, increase the size and modification in shape to make fruits more attractive and increase the quality of nutritional content. Other examples like drought-resistant corn varieties, powdery mildew disease-free wheat varieties, and improved plant varieties against parasites, fungi, and pest and environmental stresses resistant. The demand for biofuels and bioenergy has increased in the past few years where organic substrates barely have a major lignocellulosic content of approximately 33% cellulose, 20% hemicellulose, and 17% lignin in dry mass, which improved the production of biofuel along with low carbon footprint. As per the global production of barley straw more than 17 million tons per year of bioethanol producing by fermented cellulose. The recently generated Hv-COMT1 mutant barely might be improved quality feedstock as well as biofuel and including animal feed and manure possibly due to the use of CRISPR-Cas9 technology to create a transgene-free, homozygous HVCOMT1 mutant. CRISPR is a very exceptional genome modification tool that has been Transfiguring research in each industry including bioenergy. Microorganisms are also helpful for biofuel production via the organic substrate. CRISPR is playing role in the protection of yeast from damage during biofuel generation, where yeast is becoming tolerant to these pretreatment chemicals during the fermentation process due to changes occurring in a single gene. The researcher has found that where CRISPR technology protects yeast due to changes to a single gene from damage and tolerance to pretreatment chemicals by fermentation of the sugar to biofuels. *Clostridium autoethanogenum* could be genetically modified by CRISPR through gene deletion in this tiny bacterium, making it a powerful tool, used for the commercial scale production of ethanol. This gene-editing indicates feasible technology may rescue the day from a problem facing energy scarcity in the future.

APPLICATIONS

In the field of health, this CRISPR-Cas system make a wonderful and powerful tool to diagnose some critical human genetic disease like cancer, mutation, and treatment of viral infection and the possibility take place for new drug or medicine formulation by the creation of genetically modified organisms. Apart from this, some serious issues are damaging human health also as allergic reactions due to the consumption of different cereals like soybean use and wheat gluten that allergens properties have been also depleted by this technique for coeliac people. Studies on mushroom tyrosinase also reduce, which was cause the skin darkening via melanin displacement within the B16F10 melanocytes. It has also helped improve the quality of the animal, and disease free, and increased livestock production. This gene editing technique is very much useful for preventing and curing a human being before birth due to modification of the human embryo taking place. CRISPR-Cas9 methodology indicates effective and sustained genetic therapy against human viruses; it's based antiviral approach to modify human infectious viruses including HIV, HBV, and HPV. This technology used as a method for the treatment of HIV/AIDS has been developed rapidly. The golden crop high carotenoid-rich staple product has been produced by CRISPR-based genome editing, which

helps reduce vitamin-A deficiency, which causes most severe health issues like xerophthalmia, night blindness, pediatric blindness, etc. The daily need for vitamin-E for humans lies between 15 to 30 mg. Vitamin E-enriched food having antioxidant properties. Cardiovascular disease and cancer types are also associated with low content of tocopherol because deficiency of Vitamin-E may create the situation of diseases. CRISPR-Cas9 technology enhanced tocopherol and tocotrienol content through the modification of *Hordeum vulgare* homogentisatephytyl transferase (HvHPT) and *Hordeum vulgare* homogentisategeranyl transferase (HvHGGT). This gene can be beneficial for enhancing Vitamin-E content in different crops. The development of biofortified wheat can be produced with the help of Crisper-Cas9 technology which contributes to decreasing malnutrition condition in developing countries, the disrupt the gene of Inositol pentakisphate2-kinase (IPK1) which help iron biofortification in wheat, which fulfills the requirement of iron through crop biofortification. In the field of animal biotechnology CRISPR revolution could be applied to livestock and biomedicine production by precise genome editing possible in animals. Desired engineered animals possible by modification take place in the genome that enhances livestock production in the context of worldwide demand for food, animal welfare, and health, increasing efficiency, and enhancing pest control. The improvement of genome technology like CRISPR has led to a range of new ideas along with challenges associated with an organism, including productive and good traits, health improvement and welfare, conservation of the environment, and effects on human health. This technology allows the molding the living organisms and environments as never obtained before and in improved human life improvement for global well-being.

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