

Apr-Jun 2023

Name of ongoing R&D Programmes / Major Projects and their Highlights / Achievements during the period:

Novel Bioactive Food Formulation to Overcome Chemoresistance and Tumor Recurrence:

Researchers of CSIR-CFTRI discovered that diindolylmethane (DIM), a dietary bioactive compound found in cruciferous vegetables, can significantly improve the effectiveness of chemotherapeutic drugs in treating breast cancer cells. Interestingly, DIM hindered stemness properties of breast cancer cells by inhibiting tumorsphere formation, clonogenic potential, and downregulating key stemness markers. Therefore, DIM can be used as complementary medicine with chemotherapeutic drugs to treat breast cancer. However, a major limitation of DIM is the low availability in cruciferous vegetables to exert their chemopreventive potential. Hence the technology for DIM enrichment has been developed and prepared a DIM-enriched diet. The researchers have observed that the DIM-enriched diet inhibits breast tumor growth and metastasis in vivo. Further, the DIM-enriched diet alleviated doxorubicin-induced toxicity. Interestingly, the DIM-enriched diet enhanced the bioavailability of DIM compared to raw cabbage. The obtained DIM-enriched diet is currently used to develop an instant soup mix, and characterized. Overall, the DIM-enriched product obtained from the study can be used as a complementary diet for cancer patients undergoing chemotherapy.

Jul-Sep 2023

Name of ongoing R&D Programmes / Major Projects and their Highlights / Achievements during the period:

Non-digestible carbohydrates as functional mimics of human milk oligosaccharide:

Researchers of CSIR-CFTRI conducted a 16S rRNA metagenomics study on infant faecal samples and have successfully identified the most abundant bacterial species to be *Bifidobacterium infantis*, *B.breve* and *B.bifidum*. It is to be noted that the *B.breve* was found only in the abundance in the Indian infants gut but not in the infants from western population. In addition, they conducted rigorous screening of various polysaccharides and as a result, the researchers were able to identify two crucial oligosaccharides: one from a plant source and the other from an animal

source. These oligosaccharides confer a competitive advantage for the growth of B.infantis and B.bifidum, compared to B.adolescentis.

Furthermore, the findings showed that these oligosaccharides cannot be utilized by pathogenic bacteria such as E.coli and thus, no growth was observed. These results have significant implications for the development of functional foods that promote the growth of beneficial bacteria while inhibiting the growth of pathogenic bacteria.

Details of Achievements having far reaching effects / utility for the public at large :

Successful completion of **One Week One Lab (OWOL)** program during 3-7th July 2023. This event served as a platform for showcasing CSIR-CFTRI's cutting-edge research, technologies, expertise and facilities in the field of Food Science & Technology. With a theme of "Celebrating Food Research," the campaign aimed to ignite the minds of young innovators, students, start-ups, academia and industry, encouraging them to explore opportunities through deep tech ventures. The week-long campaign showcased the diversity and depth of CSIR-CFTRI research since 1950 and expertise in the field of Food Science & Technology through a series of sessions, engaging and panel discussions, interactive programs, culinary show, open day, expo and poster presentation competition with a focus on "Research, Innovations and Sustainability in Food Science and Technology." Each day was dedicated to a specific theme, providing participants with valuable insights, networking opportunities, and a glimpse into the world of food science and technology. The first day was focused with "**Startups**" with multiple sessions organised with talks and interaction with experts. The second day of the OWOL program, focused on "**Women Self Help Groups and Farmer Entrepreneurship**". The third day of the campaign was dedicated to engaging **students and the general public** in the field of Food Science and Technology. The fourth day of the campaign was dedicated to highlighting the significance of **millets** in promoting sustainable and nutritious food. The final day of the campaign celebrated the contributions of CSIR-CFTRI **alumni**. Open-days and food expo were organized on fourth and fifth days of OWOL. Many eminent personalities were visited the Institute during this period.