

World Nutraceutical Conference and Expo

July 13-15, 2015 Philadelphia, USA

Transdermal patch development of capsaicin using genomic approach for treatment of chronic low back pain

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Capsaicinoids are the compounds that give pungency to peppers. Capsaicinoids trigger pain receptors in mammals. However, long-time exposure to capsaicinoids dulls the pain receptors, making them less sensible to the compounds that trigger pain. For this reason capsaicinoids are gaining pharmaceutical use as a long-term pain reliever. Chronic back pain is the most common cause of activity limitation for people under 45 in the United States. A key point in our study is to develop value added pepper varieties adapted to local conditions. For our study, we have used a multi-disciplinary approach. At present, there is an increasing demand of vegetables with high contents of health promoting compounds in the U.S. markets. We have expanded our deliverables to include backcross derived improved varieties for various biomedical applications. Another goal of this project is the development and use of sequence based haplotyping models for cost-effective association mapping of nutraceutical traits in pepper. This method has allowed us to screen 88 accessions of *Capsicum annuum*. Coupling the capsaicinoids level data in the different accession to genetic studies will allow us to mine for better alleles to be used in breeding varieties with specific capsaicinoid concentrations. Two gel formulations of capsaicinoids were tested for their diffusion across rat skins. The results showed that both formulations tested diffuse capsaicinoids with over 50% efficiency.

Biography

Gagan Kaushal has completed his PhD from St. John's University. He is presently working as an Associate Professor in Pharmaceutics at Thomas Jefferson University. Prior to this, he served Associate Professor at University of Charleston, Postdoctoral Associate at University of the Sciences in Philadelphia, and Senior Research Scientist, Formulations at Biosyn Inc. His expertise includes drug delivery systems, formulation development, pharmacokinetics, controlled drug delivery, drug stability, and drug solubility. His interests are focused on compounding, formulation development, stability studies, bio-analysis, and pharmacokinetic studies. He also has two Investigational New Drug Applications (INDA) approved by FDA.

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