

7<sup>th</sup> International Conference on

## PHARMACEUTICS & ADVANCED DRUG DELIVERY SYSTEMS

March 27-28, 2023 | London, UK

Received date: 15-11-2022 | Accepted date: 17-11-2022 | Published date: 03-04-2023

## The intervention of OA and comorbid depressive disorder by a selective combination of pro/prebiotic treatment

## **Hee-Jeong Im**

Jesse Brown Veterans Affairs Medical Center, USA

Background: Osteoarthritis (OA) of the knee is a leading cause of chronic pain and disability, affecting >500 million adults globally. The prevalence and incidence of the disorder have been increasing continuously due to increases in lifespan and obesity. Clinically accepted treatment strategies are often ineffective, and opioids have been traditionally recommended as options for OA pain, contributing to a social problem - the opioid crisis. Because no disease-modifying OA drug is currently available, developing an effective treatment strategy for OA is a critical unmet need. OA patients show a higher prevalence of devastating depression than those without OA. Comorbidity with arthritis and depression significantly enhances persistent chronic joint pain. As OA is the most prevalent form of arthritis, depression is the most prevalent psychiatric disorder, ranking in the top five leading causes of disability worldwide. A suicide occurs every 11 minutes in the U.S., primarily due to the ramifications of untreated depression. These reports indicate that it is necessary to change the OA treatment paradigm by addressing a critical issue addressing depression as a modifiable psychological factor for better treatment of OA.

**Methods:** Probiotics are mixtures of live bacteria and yeasts that are supposed to improve health by establishing healthy gut microflora, and prebiotics stimulate the growth

of beneficial bacteria. We identified the best combination of a single probiotic strain and a single prebiotic (LAsynbiotic) for treating OA and associated depression. We evaluated LA-synbiotic as a safe and ideal OA diseasemodifying drug in our preclinical animal of knee OA pain with comorbid depression.

**Results:** Our results provide essential information demonstrating that (i) OA and depression comorbidity drastically magnify joint pain and OA pathology via the activation of VEGF signaling pathways; (ii) The LA-synbiotic synergizes its beneficial effects on joint pain and depressive disorder, establishing a co-treatment strategy; (iii) LA-synbiotic-mediated disease- modifying effects on OA and depression occur via the production of anti-inflammatory bacterial metabolites, SCFAs that modulate peripheral sensory neuronal plasticity and neuroinflammation.

**Conclusion:** Our results support (i) changes in the OA treatment paradigm by addressing depression as a critical modifiable psychological factor for better treatment of OA, and (ii) LA-synbiotic will be rapidly translatable to clinical settings not only for knee OA but also potentially for a broad spectrum of musculoskeletal pain symptoms, including low back pain, and comorbid depressive disease.



e: hsampe2@uic.edu

Medicinal Chemistry | Volume: 13 Page 57