Deterioration of the cartilage in joints is the peculiar characteristic of Osteoarthritis (OA). Currently approved therapies are focused on pain reduction and functional improvement. There are no treatments available for inhibiting structural deterioration, which is a major unmet need. Disease-modifying osteoarthritis drugs (DMOADs) are capable of inhibiting this structural deterioration in Osteoarthritis. Currently, there are no DMOADs approved in the US or EU. Major challenges in development include regulatory guidelines, current assessment by conventional radiography, and lack of patient stratification in clinical trials.