

## Title of abstract

**Injectable polynucleotides: Clinical expectation and practical application**

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## Abstract

Polynucleotide (PN) is the polymer composed of deoxyribonucleic acid with various chain lengths. Usually commercially available in the form of more chain lengths and structures than those of Poly-deoxyribonucleic acid (PDRN) thus PN is categorized as a medical device with higher viscoelasticity and PDRN is classified as a drug with more liquid-like physical property.

Injectable polynucleotides (PNs) have been used in various medical applications, including skin rejuvenation. PNs are DNA-derived macromolecules with natural origin and trophic activity, which have been found to favor cell growth and collagen production in preclinical and clinical studies.

When injected into the skin, polynucleotides signal two all-important changes to the way the skin behaves. First, it acts as a wound healing agent might do, telling skin to intensely repair, thereby reducing scar tissue (including stretch marks) and minimizing other vagaries or patches of pronounced texture on the skin. Recent studies have demonstrated the efficacy and safety of long-chain polynucleotide injections in dermatology and aesthetic medicine for skin rejuvenation, both over the face and other body areas. The pore size and skin thickness improved markedly in 30-year-old subjects,

whereas skin tone, melanin, wrinkles, and sagging were noticeably improved for patients in their 40s.

With its strong inhibition of skin inflammation, mostly via adenosine 2A receptor-mediated, polynucleotide can have sustainable anti-inflammatory action as an implant. With its physical property including low to mid degree of its viscoelasticity, it can be a good alternative for other hyaluronic acid-based dermal fillers, especially for the skin lesions with shallower depth. Clinically its best use can be the rejuvenation of high-risk subjects prone to cosmetic complications, preventing unwanted chronic inflammation and consequent complication in wound-healing process provoked by the procedures.

In conclusion, injectable polynucleotides have shown promising results in various skin applications. Further research is needed to fully understand the mechanisms of action and to develop novel PN-based medical therapies superior to other remedies.