NanoSUS (Ultra Fine Grained Stainless-Steel) for Percutaneous Spinal Injection

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Vertebral augmentation, which includes vertebroplasty and kyphoplasty, is a minimally invasive procedure to relieve the back pain caused by vertebral compression fracture (VCF) and osteoporosis-related fractures. Vertebroplasty involves the introduction of a percutaneous needle into the vertebral body followed by an image-guided injection of cement directly into the vertebra. The market size for Vertebroplasty is expected to increase from $910 million in 2019, to $1500 million in 2024 with a CAGR of 8.4%, due to the growing demand by increasing geriatric population, rising incidence of spine illness and technological advancements in this field [1].

NanoSUS Bio-Tech (USA) was found based on a collaboration between Komatsuseiki Kosakusho Co., Ltd (Japan) and Northeastern University (NEU) in 2019 [2]. This company manufactures high strength ultra-fine-grained stainless steel with antimicrobial surface. However, nanoSUS has been developing ultra-fine-grained stainless steel since 2002 [3, 4]. Using this technology, we are able to control grain size without any change in chemical composition of commercially available FDA approved stainless steel. We are able to form this stainless steel into a vertebroplasty needle using our precision machining techniques at Komatsuseiki Kosakusho Co., Ltd. We believe this product will reduce the healthcare expenses for patients suffering from VCF due to its cost-effective manufacturing process and antimicrobial surface, which reduces iatrogenic infections and shortens hospitalization time.

We are going to submit a funding proposal to Center for Disruptive Musculoskeletal Innovation (CDMI) that will aid to expand the collaboration between Komatsuseiki Kosakusho Co., Ltd and NEU.

The company will be established by financing from Komatsuseiki Kosakusho Co., Ltd (Japan), in Boston, MA. It will manage the collaborations between academia, marketing consultants and lawyers in US, and directors and researchers in Japan.

References:

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